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Draft Report

CULTURAL RESOURCES INTENSIVE SURVEY AND TESTING
OF MISSISSIPPI RIVER LEVEE BERMS,
CRITTENDEN AND DESHA COUNTIES, ARKANSAS AND
MISSISSIPPI, SCOTT, CAPE GIRARDEAU AND PEMISCOT COUNTIES, MISSOURI

CONTRACT #DACW66-83-C-0030

ITEM R-618 KNOWLTON; DESHA COUNTY, ARKANSAS

Prepared for:

Department of the Army
Memphis District, Corps of Engineers
B-314 Clifford Davis Federal Building
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David B. Waddell - Project Director



November 1, 1983

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Draft Report

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ABSTRACT

Heartfield, Price and Greene, Inc. of Monroe, Louisiana, was contracted by the Memphis District of the United States Army Corps of Engineers under contract number DACW66-83-C-0030, Item R-618, to conduct a background, archival and literature search, and an intensive resources survey of the project area of proposed Mississippi River levee berm stabilization in the vicinity of Knowlton, Desha County, Arkansas. The purpose of this project is to prevent further seepage through the levee during periods of flooding.

The area surveyed included: 152.4 meters (500 feet) right-of-way perpendicular and landside from the centerline of the levee between Station 49/0+00 and Station 52/49+05 and 2) a 304.8 - 609.6 meter (1000-2000 feet) right-of-way as measured perpendicular to and riverside from the centerline of the levee between the same stations as above.

Heartfield, Price and Greene, Inc. began background research for the project on August 1, 1983. On-the-ground survey and limited testing was conducted between September 27 and October 4, 1983. Background investigations continued throughout the on-the-ground survey, limited testing interval and between October 17 and October 19, 1983.

A total of six cultural resources were located. These included a prehistoric archeological site (3DE18/NLU-83-205), a prehistoric isolated find (NLU-83-203), an historic archeological site (NLU-83-206), an historic cemetery (NLU-83-207) and a modern dump (NLU-83-209).

No sites will be impacted under the present contract. One site, 3DE18, the prehistoric mound, cemetery and village, is believed significant and is believed to be potentially eligible for inclusion on the National Register of Historic Places. One other site (NLU-83-207), the historic cemetery, although it is not eligible for inclusion on the National Register of Historic Place should not be impacted. None of the other sites is considered potentially significant.

Under the present contract no further work is recommended at these sites. However, if a change in the present plans is made and 3DE18 (NLU-83-205) is in a zone of impact, additional testing and mitigation should be done.

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INTRODUCTION

Description of Project

Heartfield, Price and Greene, Inc. of Monroe, Louisiana, was contracted by the Memphis District of the United States Army Corps of Engineers under contract number DACW66-83-C-0030, Item R-618, to conduct a background, archival and literature search, and an intensive resources survey of the project area of proposed Mississippi River levee berm stabilization in the vicinity of Knowlton, Desha County, Arkansas (Figure 1-1). The purpose of this project is to prevent further seepage through the levee during periods of flooding.

The area surveyed included: 1) 152.4 meters (500 feet) right-of-way perpendicular and landside from the centerline of the levee between Station 49/0+00 and Station 52/49+05 and 2) a 304.8 - 609.6 meter (1000-2000 feet) right-of-way as measured perpendicular to and riverside from the centerline of the levee between the same stations as above (Figure 1-2).

Levee stabilization work will consist of 1) adding to and extending the existing landside levee berm between Station 49/0+00 and Station 49/3+00 and 2) excavation of borrow material with which the berm will be constructed. The berm will vary in depth from approximately .61 to 3.66 meters (2-12 feet) and will extend from 79.25 to 106.68 meters (260 x 350 feet) from the toe of the levee. Excavation for borrow material will be conducted in the two riverside areas available for borrow. Borrow will be excavated from the abandoned levee in the area before using the other borrow pit. Actual extent and depth of borrow excavations will be dependent upon the amount of material required to construct the berms (location of berms and areas available for borrow are denoted in Figure 1-2).

Regulatory Criteria

The survey was conducted in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (PL 89-665), as amended; the National Environment Policy Act of 1969 (PL 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment," 13 May 1971; Preservation of Historic and Archeological Data, 1974 (PL 93-291), as amended; and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

The National Register of Historic Places criteria for evaluation of significance (36 CFR Part 60.6) were applied to all cultural resources identified. These criteria are:

"The quality of significance in American history, architecture, archeology and culture is present in districts, sites, buildings, structures and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and (a) that are associated with events that have made a significant contribution to

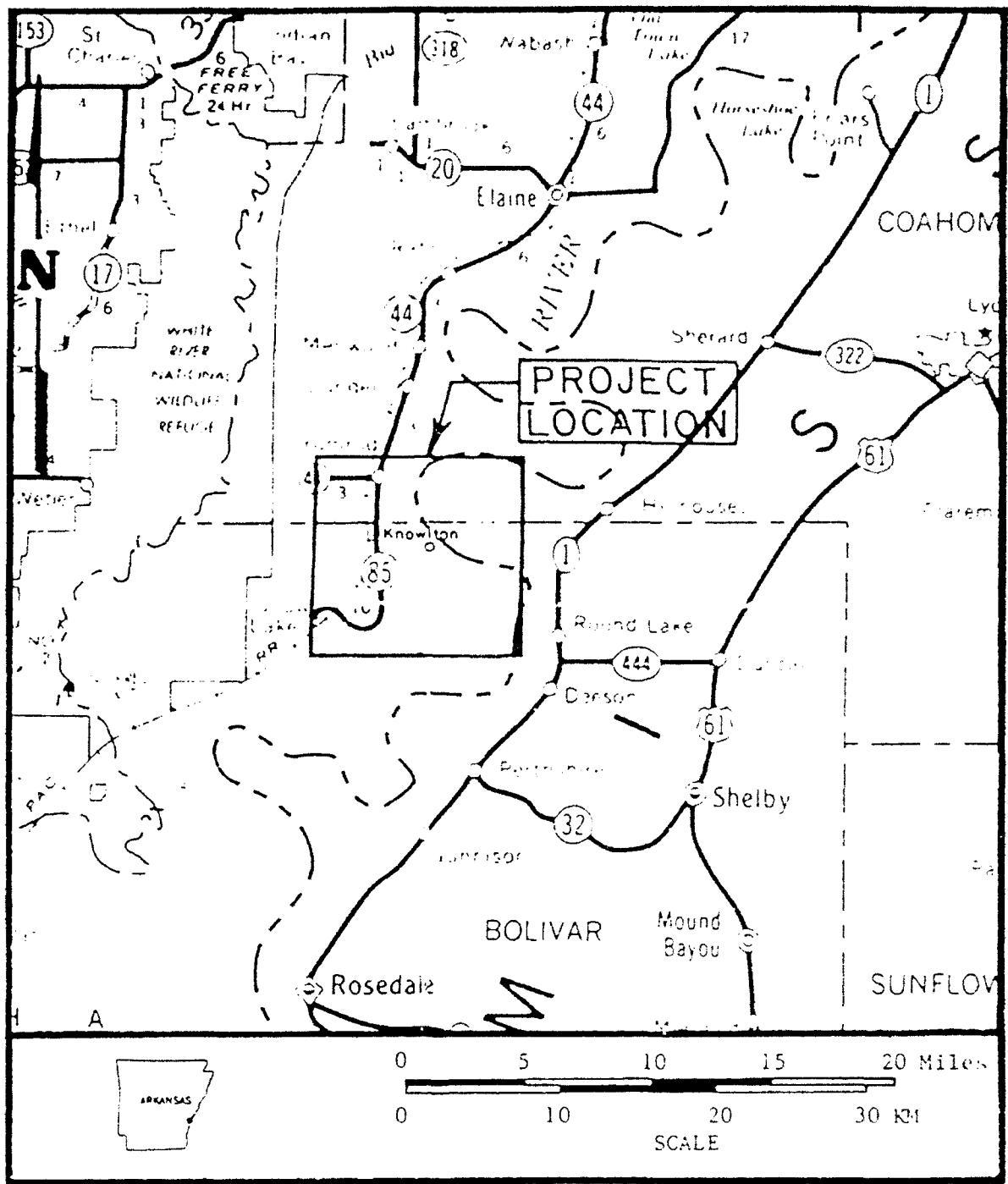


Figure 1.1 General vicinity map of the proposed levee berm stabilization project

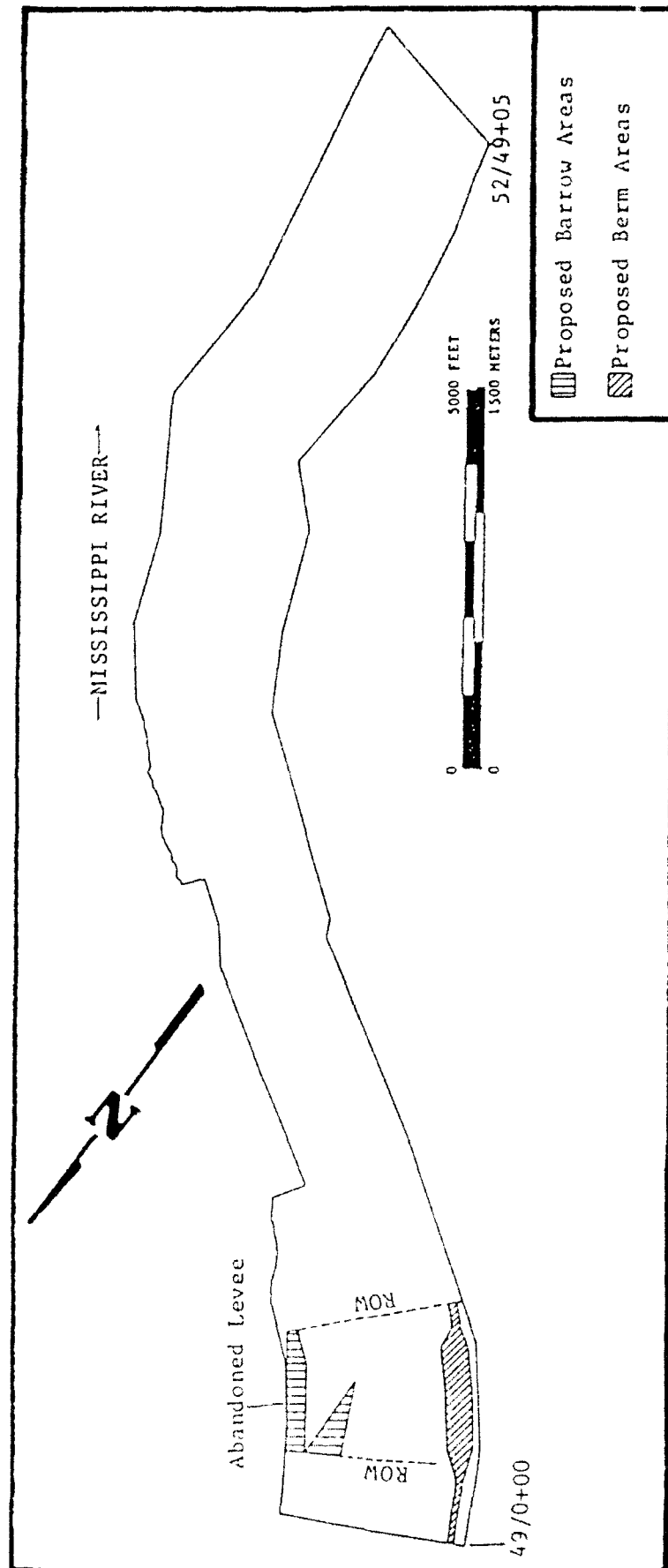


Figure 1.2 Map of the proposed levee berm stabilization project

the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history" (36 CFR Part 60.6).

It should be noted that certain classes of cultural resources are not ordinarily considered eligible for inclusion on the National Register of Historic Places. These are:

- o cemeteries, birth places or graves of historic people;
- o properties primarily of a religious or commemorative nature;
- o properties that have been moved or reconstructed;
- o properties that have become significant within the last 50 years.

Scope, Time Frame and Personnel

The Scope of Work (Descriptions/Specifications) is included as Appendix A. This document defines the tasks and requirements of the background, archival and literature search, and the intensive resources survey required by the contracting agency. Heartfield, Price and Greene, Inc. began background research for the project on August 1, 1983. On-the-ground survey and limited testing was conducted between September 27 and October 4, 1983. Background investigations continued throughout the on-the-ground survey, limited testing interval and between October 17 and October 19, 1983.

The project principal investigator was Lorraine Heartfield, Ph.D. The project director was Nancy W. Clendenen. Cultural resources archival investigations were conducted by David B. Waddell and Nancy W. Clendenen. The environmental overview was prepared by Edward L. Beene and Nancy W. Clendenen. The fieldwork was conducted by Nancy W. Clendenen, David Hovde, Brian Gay and G. R. Dennis Price. Report preparation was a joint effort by the project director, project staff and principal investigator.

Curation

Artifacts will be curated with the University of Arkansas Museum (Michael P. Hoffman, January 5, 1983:personal communication).

2.0 ENVIRONMENTAL SETTING

Physiography

The project area is located in the Mississippi River Alluvial Valley of the Central Gulf Coastal Plain physiographic province and, more specifically, within the Lower White River Basin of the Western Lowlands (Fisk 1944:24). The Central Gulf Coastal Plain, which is co-extensive with the Atlantic Coastal Plain on the east, is located between Georgia and the Rio Grande River south of Texas and averages more than 321.8 km. (200 miles) in width as measured perpendicular to the Gulf of Mexico. The broad Mississippi River Alluvial Valley extends from north to south and divides the Coastal Plain about equally in half (Fisk 1944:26, 57-58).

The Lower White River Basin is bounded on the east by the Mississippi River, on the south by the White River, north of Big Island, on the west by the Grand Prairie Ridge and on the north by the early Wisconsin-age terrace edge beyond Big and Lick Creeks (Jeter et al 1982:SE 2).

The physiography of the region is characterized by floodplain and meander belt features that are related variations of the present meander belt of the Mississippi River. Irregular ridges and swales in the eastern part of the floodplain mark braided channel positions of the Mississippi River. These braids are continuations of braids located on the dissected surface north of the Big Creek Escarpment (Fisk 1944:24).

Natural physiographic features within the Alluvial Valley include natural levee ridges, point bar ridges and sloughs, abandoned stream channels and backswamp deposits. Natural levee deposits consist of ridge-like masses of silts, sands and silty clays laid down by over-bank flow during periods of flooding. The deposits are thickest and coarsest at their crests along the riverbank but thin rapidly and become finer landward as they merge with backswamp deposits (Fisk 1944:18).

Point bar ridges are characterized by alternating, interbedded silty sands and clay deposits. Abandoned channel and point bar sloughs are characterized by deposits of fine-grained silts and clays. These are often referred to as "clay plugs." The point bar ridges and sloughs form arcuate patterns which form a distinctive ridge and swale topography (Fisk 1944:19).

The most extensive deposits of the floodplain are those laid down in the floodbasins beyond the natural levees. These backswamp deposits consist principally of interbedded, thinly laminated, silty clays and clays with a high organic content. Both backswamp deposits and natural levees tend to mask older strata. In contrast, the ridge and swale topography, in association with abandoned channels, can be used to identify areas that have been reworked by river meander activity (Fisk 1944:20).

Geology

The project area is located in the central division of the Lower Mississippi River Valley on the present floodplain of the Mississippi River. The existence of a buried valley system underlying the Mississippi Alluvial Valley

has been recognized since 1881 when deep borings made by the Mississippi River Commission disclosed that the alluvium extended far below the maximum depth of the channel of the modern river. Fisk (1944:11, 69-70) suggests this buried valley was excavated during the last glacial stage, the Late Wisconsin, and was subsequently filled with Recent (Holocene) alluvium. This entrenchment would have been in response to a drop in sea level, with downcutting beginning at the Gulf of Mexico and working headward, resulting in stream gradients which steepened gulfward. The streams flowing along the steep slopes would have been able to transport the coarse material made available by erosion in the deeply weathered surface of the stream basins. Melting of the ice in each of the interglacial stages would have raised the base level of the streams, resulting in a decreased stream gradient, loss of ability to transport coarse sediments and the deposition of alluvium.

In contrast, utilizing more recent data, Saucier (n.d.:9) suggests the Mississippi River responded to sea level changes no further north than Baton Rouge, Louisiana. Whereas Fisk postulated that the Alluvial Valley was deeply entrenched throughout and "swept clean" of alluvium during waxing glaciation, it now appears that considerable valley fill was deposited by braided streams carrying coarse-grained glacial debris. These braided streams, although aggrading the valley, accomplished appreciable valley widening through lateral planation and valley deepening through periodic scouring of the underlying bedrock (Saucier 1974:2).

Saucier (1974:4) suggests that during each glacial cycle, a period was reached where stream sediment level and discharge declined to a point where the Mississippi River changed from a braided to meandering regime, starting at the Gulf and proceeding up valley. In the case of the last cycle (Late Wisconsin Glacial), the Mississippi River changed from a braided to meandering regime quite abruptly (about 12,000 years ago) south of Baton Rouge, while it did not do so until possibly 6,000 years ago north of Memphis, Tennessee.

If Saucier's interpretation is correct, then it appears the Alluvial Valley was never swept clean of sediments during maximum low sea level, rather, there would have remained a rather thick sequence of coarse alluvium. This implies the existence of a large number of buried land surfaces of appreciable antiquity. During the period 7,000-12,000 years ago the valley would have filled slowly resulting in discrete floodplain surfaces that would have remained relatively stable for periods as long as hundreds of years. The circa 12,000 B.P. (A.D. 10,000) surface would be only 1.5-6.1 meters (5-20 feet) below the present surface in areas undisturbed by river meander activity in the vicinity of Memphis (Saucier 1974:9-13).

The geologic deposits of the project area are completely of Cenozoic age and consist of an underlying base of the Claiborne Group overlain by intrusions of the Jackson Group (Eocene series) underlying recent alluvium (Fisk 1944:plate 25). The Claiborne Group of sediments were massive formations of glauconitic sand and calcareous clay with local limestone concretions interbedded with thicker brackish water facies of sands and carbonaceous chocolate-colored silts and clays. In subsurface formations, the alternations of the lithologic group which occurs at the surface is largely unclear (Fisk 1944:62).

The Jackson Group of sediments consist of clays, sandy shales and sands with thin lignite beds in fluviatile and brackish-water deposits which inter-finger with the massive deposits. The clays of this group contain marine fossils as far north as Memphis, Tennessee (Fisk 1944:62).

The recent alluvium is a large mass of stream deposits which partially fills the Mississippi River entrenched valley system. The average thickness is 38.1 meters (125 feet) in the northern half of the valley. The alluvium consists of a sequence of sediments which grades irregularly upward from coarse graviliferous sands into progressively finer deposits of sands, silts and clays. This general upward decrease in grain size values makes it possible to divide the recent alluvial section into a basal graveliferous unit and an upper non-graveliferous unit. The upper deposits can be further subdivided into pervious sands, gradational with the underlying graveliferous sediments of the top stratum and into relatively impervious sediments of the top stratum. Coarse materials also occur within the upper, generally non-graveliferous unit, especially within meander belts (Fisk 1944:17).

Alluvial History

Fisk (1944:Plate 22, Sheets 4 and 5) delineates five channel stages (10, 11, 13, 15 and 16) of the Mississippi River within the project area. Also in the project area is an area that is not classified by Fisk as to meander activity. This may be a remnant upland or unidentified channel predating channel 10. These five channels include, from oldest to youngest, the number 10 channel during which time the drainage north of Rosedale, Mississippi had assumed essentially the form it has today, the number 11 channel during which time the Walnut Bayou course was abandoned through a diversion near Vicksburg, the number 13 channel during which time the Saint Bernard subdelta was built, the number 15 channel during which time the Barataria subdelta was built and the number 16 channel during which time the river took a new course along the Lake Borgne fault zone. Saucier (1974) identifies a single Mississippi River Meander Belt (Number 5) within which the project area is located.

Fisk (1944:42) divided the history of the evolution of the present meander belt into 20 stages, numbered 1 to 20, separated by intervals of 100 years, each of which is represented by a reconstructed channel (stages 17 through 20 are marked by historic) course. Thus, Fisk dates the number 10 channel to circa A.D. 1000, the number 11 channel to circa A.D. 1100, and the number 13, 15 and 16 channels to A.D. 1300, A.D. 1500 and A.D. 1600, respectively.

Saucier (1974:1-2) suggests there is now reason to believe that the present meander belt was first established 2,800 years ago in the southern part of the valley. This suggests that the earlier numbered channels may be older than the estimates provided by Fisk.

Using Fisk's (1944:Plate 27, Sheet 7) date, by approximately A.D. 1000+700 a series of meanders began progressing through the project area. This activity has continued to the present day with successive channels from 10 through 19 being present in the project area or its immediate vicinity (Figure 2-1). Resulting from this activity land surfaces in the southern portion of the study area will date no earlier than approximately A.D. 1500 to 1600+700. Land surfaces in the northern portion of the area will be no earlier than A.D. 1000+700, while those in the center are undated and may predate A.D. 1000.

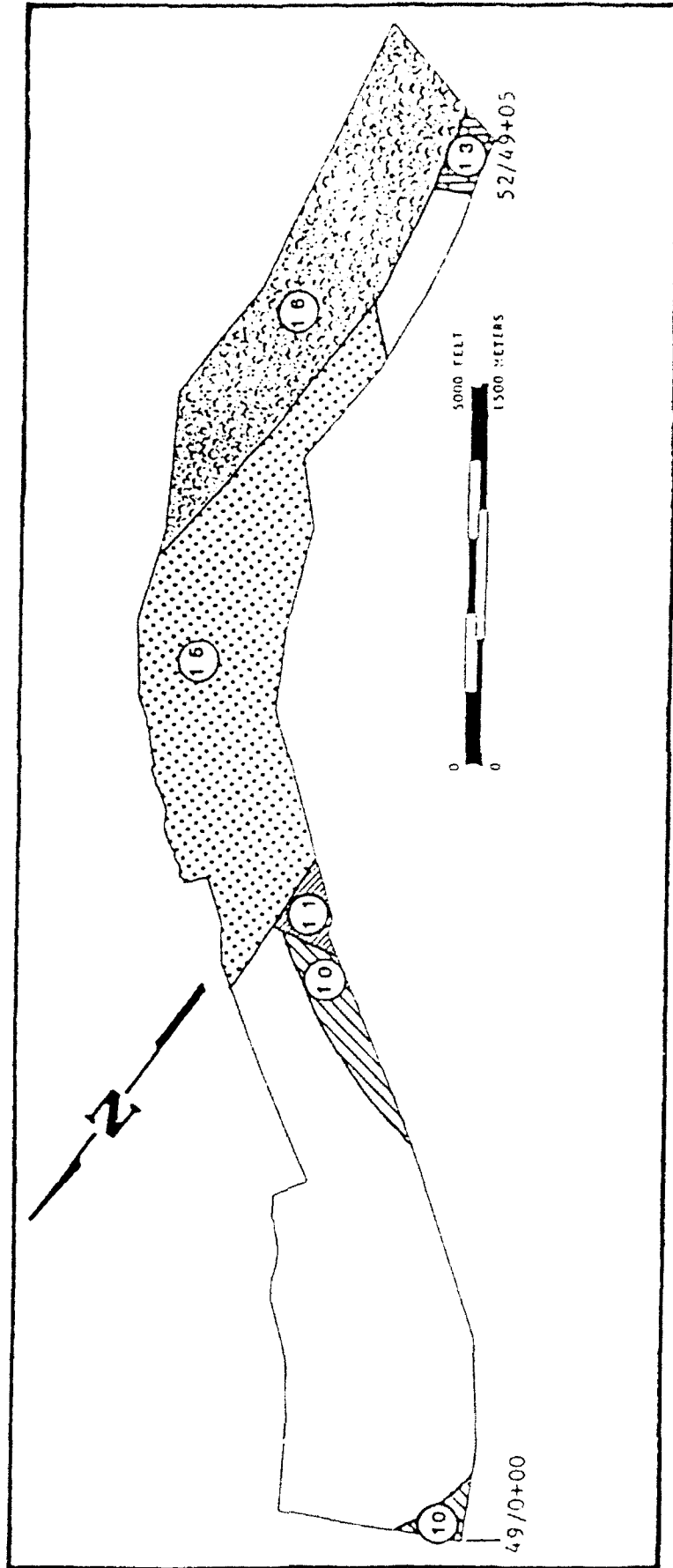


Figure 2.1 Relative location of channel meanders of the Mississippi River(after Fisk 1944)

Further, some land surfaces in the study area are today being progressively eroded and others are in the process of deposition as shown by the meander lines of 1830 and 1833 as well as a comparison of the original surveys of the area (GLO 1830 Survey) to present topographic quadrangles (Figure 2-2).

Soils

Soils in the project area consist of the Sharkey-Commerce-Coushatta association (Gill et al 1972). Soils of this association are level and gently undulating, poorly drained to well drained, clayey and loamy soils. They occur on broad flats broken by undulating areas which are characterized by ridges separating long narrow depressions. These ridges are .61 to 1.22 meters (2-4 feet) higher than the depressions. Most of the association is on the riverside of the levees of the Arkansas and Mississippi Rivers (Gill et al 1972:3). The association consists of 40% Sharkey soils, 30% Commerce, 20% Coushatta and the remaining 10% Newellton, Bruno and Tunica soils (Gill et al 1972:3).

Specific soils in the project area are the Sharkey-Commerce-Coushatta association, frequently flooded; Bruno loamy sand, gently undulating; Commerce silt loam, 0 to 1 percent slopes; Newellton clay, 0 to 1 percent slopes; Sharkey clay and Tunica clay, 0 to 1 percent slopes. Soils in the project area are depicted in Figure 2-3.

The Sharkey-Commerce-Coushatta, frequently flooded association occurs along the Mississippi in areas not protected by levees.

Sharkey soils of the association have a surface layer of gray to very dark grayish-brown clay about 12.7 centimeters (5 inches) thick. Generally the subsurface is gray to dark gray clay mottled with gray and brown. Occasionally the underlying material is reddish-brown clay (Gill et al 1972:15).

Commerce soils of the association have a 12.7 centimeter (5 inch) surface layer of dark brown or brown silt loam or silty clay loam mottled with brown and gray. The subsoil is a grayish-brown to dark gray, mottled silt loam or silty clay loam (Gill et al 1972:15).

Coushatta soils of the association have a 12.7 centimeter (5 inch) surface layer of dark brown or brown silt loam or silty clay loam. The subsoil is a reddish-brown or dark reddish-brown silt loam or silty clay loam. Underlying this is a dark brown or strong brown, thinly stratified sandy loam to silty clay loam (Gill et al 1972:15).

This association is suited to hardwood woodlands and wildlife habitat. It is not suitable for cultivation because of its frequently flooded nature (Gill et al 1972:15).

Bruno loamy sand, gently undulating, is a soil that occupies low parallel ridges and swales. The surface layer is a dark grayish-brown to brown loamy sand 12.7 centimeters (5 inches) thick. From 15 to anywhere from 66 to 114 centimeters (5 to 26-45 inches) is a pale brown to light yellowish-brown sand to loamy fine sand containing thin lenses of fine sandy loam to silty clay. Below this is a reddish-brown to brown silt loam to fine sandy loam. This

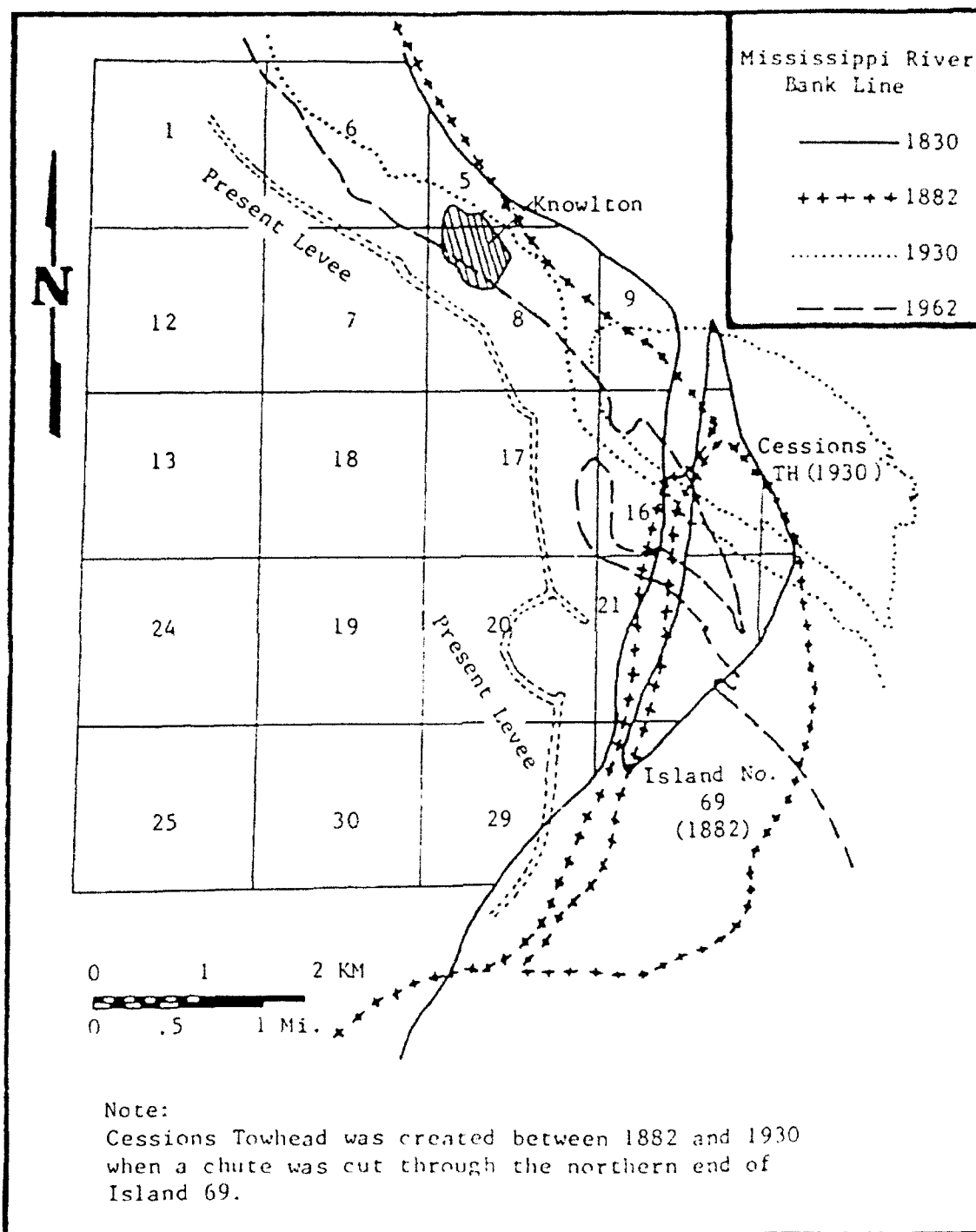


Figure 2.2 Mississippi River Bank Lines 1830 to 1962

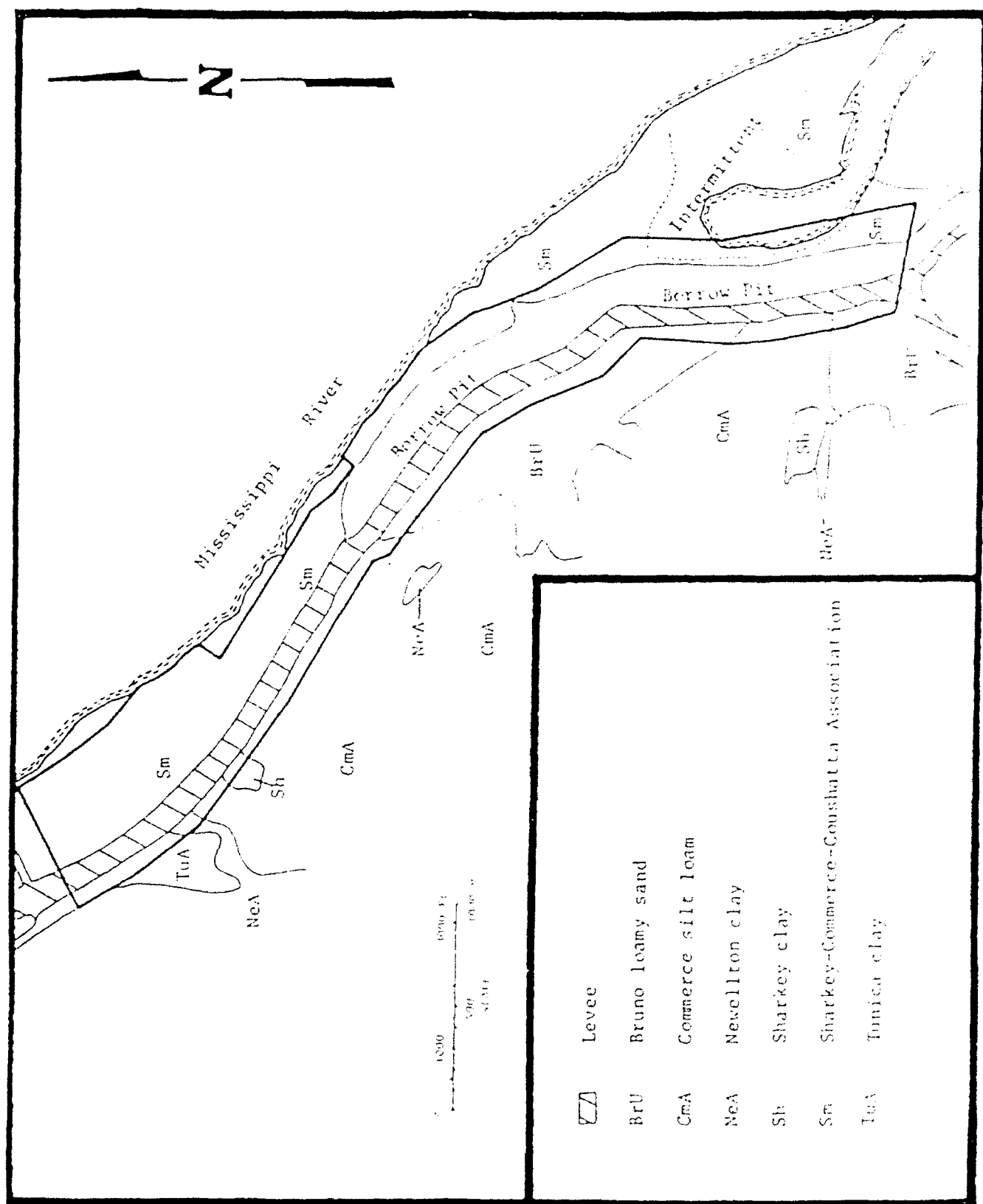


Figure 2.3 Specific soils within the project area (from Gull et al 1972)

layer is underlain by gray to dark reddish-brown silty clay or clay. Runoff on this soil is very slow and permeability is moderate. Natural fertility is low and the soil is poorly suited to most crops (Gill et al 1972:6).

Commerce silt loam, 0-1 percent slopes, is found in beds of stratified loamy alluvium on natural levees. The surface consists of a brown to dark grayish-brown silt loam 35.5 centimeters (14 inches) thick. The subsoil is a grayish-brown or a dark grayish-brown silt loam or silty clay loam mottled with brown and gray. Under this is a grayish-brown to dark gray mottled silt loam or silty clay loam. Runoff on this soil is slow and permeability is moderately slow. Natural fertility is high and the soil is well suited to crops if kept from flooding (Gill et al 1972:7).

Newellton clay, 0 to 1 percent slopes, is found in thin beds of clayey sediments and the underlying loamy sediments. The surface layer is a dark grayish-brown or very dark grayish-brown 12.7 centimeters (5 inches) thick. The upper subsoil is grayish-brown or dark grayish-brown clay or silty clay 20 to 38 centimeters (8 to 15 inches). The lower part is dark grayish-brown to brown silt loam to sandy loam mottled with gray and brown. Runoff is very slow and permeability is slow except when the ground is cracked. Natural fertility is high but this soil can be cultivated only within a narrow range of moisture content (Gill et al 1972:11).

Sharkey clay is formed in thick beds of fine textured slack water deposits from the Mississippi River. It is found on broad level flats or occasionally gently undulating areas. The surface layer is a gray to very dark grayish-brown clay 12.7 centimeters (5 inches) thick. In most cases the subsoil is gray to dark gray clay mottled with brown and gray. Occasionally the underlying material is a reddish-brown clay. Runoff is very slow and permeability is very slow except when the ground is cracked. Natural fertility is high but this soil can be cultivated only within a narrow range of moisture content (Gill et al 1972:14-15).

Tunica clay, 0 to 1 percent slopes, is formed in thin beds of clayey sediments underlain by loamy sediments. It is found in level to gently undulating slackwater areas. The surface layer is a dark grayish-brown to very dark gray clay 12.7 centimeters (5 inches) thick. The subsoil is 38 to 78.7 centimeters (15 to 31 inches) of gray or dark gray clay or silty clay. Below this is a grayish-brown to dark gray silty clay loam to fine sandy loam mottled with brown. Runoff is slow and permeability is very slow except when the soil is cracked. Natural fertility is high but this soil can be cultivated only within a narrow range of moisture content (Gill et al 1972:16).

Paleoenvironment

The discussion of the paleoenvironment will be limited to 20,000 B.P. (before present) as this is generally believed to be the time of entry of the Paleo-Indian to North America. Principal references for the discussion include Wharton (1978), Harshberger (1958), Simpson (1941; 1945), Mosimann and Martin (1975), King and Allen (1977) and Delcourt et al (1980).

A brief synopsis of major chronological events since 20,000 BP according to Wharton (1978) is provided. At 20,000 BP the Wisconsin Glacial Stage was at its peak, with its coolest temperature and southernmost extension of

glaciers. By 14,000 BP, the boreal forest had retreated to the north and sea level for the Gulf of Mexico had begun to rise. A warming trend started prior to 14,000 BP and accelerated through 10,000 BP. The Wisconsin Glacial Stage ended in 10,000 BP (Miller 1974). The hypsithermal period began approximately 9,000 BP and continued for 3,000 years. By 2,500 BP, the sea level had risen to present-day levels. A world-wide cooling trend was experienced in the 16th century (Wharton 1978).

Paleobotany

Based upon an arboreal pollen assemblage from Noconah Creek, located in the loess mantled Blufflands along the eastern wall of the Lower Mississippi Alluvial Valley in Tennessee, Delcourt et al (1980:125-127) suggests that, between approximately 23,000 B.P. and 13,000 B.P., spruce dominated the record with fir and larch present. This period would span the full and late glacial of the Woodfordian Substage of the Wisconsin Stage. However, the continuous representation of many deciduous forest taxa from full-glacial sediments, along with macrofossils of beech, yellow poplar and hickory suggests that at least small populations of deciduous tree species survived the full glacial at the Noconah Creek locality. From the pollen and fossil data they postulate that during the late Wisconsin continental glaciation, winters were cooler than at present but were not severe, with extremes in minimum temperature not exceeding -40°C.

Between approximately 16,500 and 13,000 B.P., Quercus pollen increased from 11 to 33%. Pollen of Nyssa, Casta ea, Mirica type and Ilex type also occurred within the late glacial sequence. The increase in pollen of oak and other deciduous taxa reflects a local expansion of populations of deciduous taxa and the northward migration of warm-temperature tree species from their full-glacial refuges (Delcourt et al 1980:127).

According to Harshberger (1958), the ancestral forests, remnants of a large Miocene deciduous forest that virtually covered the United States east of the Mississippi River, were located through the central-eastern United States. As the glaciers retreated further north, the ancestral forest migrated south, east, and north in concentric waves similar to those associated with a stone tossed in the water. Harshberger's proposed order of invasion is as follows:

WIND CARRIED SEEDS

- | | |
|--|------------------------------|
| 1. <u>Picea alba</u> (=P. <u>canadensis</u>),
farthest north | 6. <u>Betula papyrifera</u> |
| 2. <u>Picea nigra</u> (=P. <u>mariana</u>),
farthest north | 7. <u>Abies balsamea</u> |
| 3. <u>Latrix americana</u> (=P. <u>laricina</u>) | 8. <u>Pinus strobus</u> |
| 4. <u>Populus balsamifera</u> | 9. <u>Thuja occidentalis</u> |
| 5. <u>Populus tremuloides</u> | 10. <u>Ulmus americana</u> |
| | 11. <u>Acer saccharum</u> |
| | 12. <u>Tsuga canadensis</u> |

ANIMAL CARRIED SEEDS

- | | |
|----------------------------|--|
| 13. <u>Quercus rubra</u> | 16. <u>Castania americana</u> (=dentata) |
| 14. <u>Fagus americana</u> | 17. <u>Juglars nigra</u> |
| 15. <u>Quercus alba</u> | |

The migratory forest generally continued the same genera as are present today, with the exception of chestnuts (Castanea), which have been killed by the Chestnut Blight. These genera include oaks (Quercus), ashes (Fraxinus), and hickories (Carya) (Harshberger 1958).

King and Allen's (1977:307-320) analysis of a Holocene peat section from the Old Field, a large swamp within the Morehouse Lowland at the northern end of the Mississippi Embayment, indicates there are fossil pollen sequences that contain evidence of the mid-Holocene warm/dry interval variously referred to as the Hypsithermal, the altithermal and the xerothermic. Analysis of the pollen column suggests that by 8,700 B.P. species associated with open swamp were declining while the herb and grass communities were expanding. The decline in swamp vegetation and its implications of a drier climate in eastern Arkansas coincides chronologically with the onset of drier conditions in the northern Midwest, a shift from forest to herbaceous vegetation in Iowa and an increase in eolian deposition at Graham Cave in Central Missouri.

After 5,000 years B.P., pollen percentages indicate renewed development of bottomland arboreal vegetation and an increase in swamp size. An increase in the oak pollen percentage may reflect an increase in oak trees in the Ouachita uplands to the west. These changes suggest an increase in effective precipitation. However, the pollen record does not indicate a return to an environment similar to that which occurred prior to 8,700 B.P. since from 5,000 to 3,000 B.P. the arboreal community expands, but the effects of the relatively dry climate were still evident (King and Allen 1977:320-321).

Presettlement forests on the Loess-capped uplands east of the Mississippi Valley and on Crowley's ridge included mesic tree taxa such as beech (Fagus grandifolia), yellow poplar (Liriodendron tulipifera), oaks (Quercus spp.), hickories (Carya spp.), sugar maple (Acer saccharum), walnuts (Juglans spp.) and ashes (Fraxinas spp.) (Delcourt et al 1980:113).

Floodplain forests were dominated by willows (Salix spp.) and river birch (Betula nigra) where sedimentation was rapid. Poorly drained alluvial bottomlands favored oaks, gums (both Nyssa sylvatica and N. biflora) and bald cypress (Taxodium distichum). Elms (Ulmus spp.), ashes, cottonwoods (Populus spp.), maples, hackberry (Celtis laevigata), hickories, sycamore (Platanus occidentalis) and persimmon (Diospyros virginiana) occupied better drained immature alluvial soils. Soil development on bottomland sites favored vegetation succession to oak-hickory forest with the addition of sweetgum (Liquidambar styraciflua), beech, magnolia and hollies (Ilex spp.) (Delcourt et al 1980:113-114).

Swamp vegetation was characterized by black willow (Salix nigra), cottonwood (Populus deltoides), bald cypress, gum (Nyssa uniflora), many oaks, hickory (Carya aquatica), sweetgum, ash, planer-tree (Planera aquatica), persimmon, honey locust (Gleditsia triacanthos), red maple (Acer rubrum), silver maple (Acer saccharinum) and cane (Arundinaria gigantea) (Delcourt et al 1980:114).

Paleozoology

Many exotic forms of animal life existed in the study area. According to Mosimann and Martin (1975), there were three (3) genera of elephants, six (6)

genera of giant edentates, 15 genera of ungulates and various giant rodents and carnivores north of Mexico. Surely many of these were forest denizens and occurred in the study area. Maps presented by Simpson (1945) indicate that the genus Tapirus (tapirs) occurred in the study area. Mosimann and Martin (1975) stated that four genera of giant ground sloths were present in the United States, including Megatherium. As the study area was forested, it is highly probable that these forms did exist in the study area. Simpson (1941) stated that three large felines occurred throughout the earlier United States. These include the puma (Felis concolor), jaguar (Panthera onca), and the giant jaguar (Panthera atrox). By 15,000 B.P. the large megafauna had given way to that found during modern times. check
concolor

Historic Environment

Climate

The climate of Desha County is one of mild winters and hot summers. Temperature extremes range from highs of 41.67 C (107°F) in the summer to lows of 12.22 C (10°F) in the winter (Gill et al 1972:46-47).

Precipitation averages 132 centimeters (52 inches) per year with 60% of the annual rainfall occurring in the winter (Gill et al 1972:46). Snowfall is negligible and usually melts within 24 hours (Gill et al 1972:46). The growing season averages 222 days with the average last date of freezing on March 24 and the first in the fall November 15 (Gill et al 1972:46).

Flora

The study area is located in Harshberger's (1958) Lower Alluvial Forestland of the Arkansas-Louisiana District and in the Southeastern Lowlands Region of Steyermark (1963). Both authors describe a hydric bottomlands forest area on swampland, depending on frequency and duration of floodwaters. The dominants include Bald cypress (Taxodium distichum), oaks (Quercus lyrata, Q. phellos, Q. nigra), hickory (Carya aquatica), swamp cottonwood (Populus heterophylla), maple (Acer rubrum), gum (Nyssa sylvatica), ash (Fraxinus tomentosa), buttonbush (Cephalanthus occidentalis), honey locust (Gleditsia aquatica), Planer tree or water elm (Planera aquatica), wisteria (Wisteria macrostachya), grape (Vitis palmata), and Leitneria floridana (Harshberger 1958; Steyermark 1963). cottonwood

In addition to the above, Steyermark (1963) lists the following dominant herbaceous and aquatic species (scientific name only): Arundinaria gigantea, Rhynchospora Carex louisianica, Wolffiella floridana, Hymenocallis occid, Iris fulva, Thalia dealbata, Cabomba carolinians, Linceolata, Ludwigia glandulosa, Eryngium prostratum, Cadium digitatum, Lysimachia radicans, Asclepias pere, Hydrolea uniflora, Justicia ovata, Diodia virginiana, Candia uniflora, Cayaponia grandifolia, Spilanthes anea var. repens, and Pluchea camphorata.

This type of forest provides an abundance of berries and nuts, as well as providing an excellent cover for game. Also various medicinal and poisoning species are present in such a forest.

Fauna

As the study area is located on the Mississippi River, a vast amount of aquatic fauna is present. Fishes include the following families: sturgeon (Acipenseridae), paddlefish (Polyodontidae), bowfish (Amiidae), pickerel (Esocidae), suckers (Catostomidae), catfish (Ictaluridae), temperate basses (Percichthyidae), sunfishes and bass (Centrarchidae) and drum (Sciaenidae). Turtles include snapping turtles (Chelydridae) and softshell turtles (Trionychidae). The frogs include the family of true frogs (Ranidae). The invertebrates include the clams (Phylum pelecypoda) and crayfish (Cambrus and Procambrus). Most if not all of these may have been utilized for food by pre-historic populations.

Many families of avifauna are present in the area. The study area is located in the Mississippi Flyway migratory route. As a result an abundance of waterfowl such as ducks and geese (Anatidae), coots, rails and gallinule (Raillidae) are available. In the past wild turkey (Meleagrididae) and passenger pigeons (Columbidae) were probably exploited as a food source although the latter is extinct today and the former rare in the area. Other aves probably utilized as food sources that exist today are quail (Phasianidae) and mourning dove (Columbidae).

Mammalian families found today and probably utilized by aboriginal populations are the squirrels (Sciuridae), rabbit (Leporidae), racoons (Procyonidae), bear (Ursidae), opossums (Didelphidae) and deer (Cervidae).

3.0 PREVIOUS INVESTIGATIONS

Previous Archeological Investigations

American archeology as a scientific discipline is a relatively recent phenomenon. According to Willey and Sabloff (1974:40), "As of 1840, American archaeology as a scholarly entity simply did not exist." As the United States expanded its boundaries westward, it became apparent that North America possessed copious remains of prehistoric peoples in the form of mounds, earthworks and large village sites. An increased interest in the discovery and description of antiquities followed and developed into what is described by Willey and Sabloff (1974:42) as the Classificatory-Descriptive Period (1840-1914) of American archeology. During this time archeology became an established vocation. Museums, universities, scientific societies and government sponsored expeditions were designed to locate and record sites and collect specimens for their collections.

It was during the Classificatory-Descriptive Period that the first systematic study of the prehistory of the Mississippi Valley was conducted. Squier and Davis (1848) were commissioned by the Smithsonian Institution, with the support of the American Ethnological Society, to examine the mounds of the Ohio and Mississippi River valleys in order to address the question of the origin of these tumuli. Although they believed they were constructed by a great race of mound builders, their study represents the first regional study of the antiquities of the Mississippi Valley and resulted in an impressive number of site plans along the Mississippi River.

Edward Palmer representing the Division of Mound Exploration of the Smithsonian Institution partially excavated several mounds in southeastern Arkansas. His findings were reported on by Thomas (1891, 1894). Also in the 1800's William H. Holmes (1886) published his study of Mississippi Valley ceramics in which he divided the valley into upper, middle and lower provinces. The majority of his sample was taken from the Middle Mississippi Province.

During the period 1910-1911, Clarence B. Moore (1911) conducted a series of investigations throughout the southeastern United States, including the Mississippi Valley. On one such trip Moore attempted to record all prehistoric sites within three miles on each side of the Mississippi River from New Orleans, Louisiana, to a point somewhat above Wilson, Arkansas, not far from the southeastern boundary of Missouri. Emphasis was placed on descriptions of burials and associated ceramics rather than theoretical advancement.

Moore visited only one site in the general vicinity of the project area. This was Avenue in Phillips County located about 12.8 to 16 kilometers (8 to 10 miles) north of the study area. At Avenue Moore spent three days excavating with the help of seven men. Sixty-two burials were dug with none being deeper than 2 feet. A total of 75 vessels were found with only one not being associated with burials. Burials were both extended and bundle type. Three burials were accompanied by non-ceramic artifacts. The total number of individuals buried could not be ascertained as the bones were so badly decayed (Moore 1911:401-402).

The introduction of stratigraphic excavation to American archeology, about 1914, produced a shift in research concerns of American archeologists. The central theme was a concern for chronology. Willey and Sabloff (1974:83) have divided this period, The Classificatory-Historical Period (1914-1960) into two subperiods: 1) Concern with Chronology (1914-1940) and 2) Concern with Context and Function (1940-1960). During the first subperiod the principle of seriation was developed in conjunction with stratigraphic studies. Typology and classification, which had their beginnings in the previous Classificatory-Descriptive Period, now became geared to seriation and stratigraphic procedures. Whereas earlier classifications of artifacts were for the purpose of describing material, they were now used as aids for plotting culture forms in time and space. The ultimate objective was the development of cultural-historical syntheses of New World regions and areas (Willey and Sabloff 1974:83).

The close relationship between American archeology and ethnology led easily to the use of ethnographic analogies in interpretations of use and function in prehistoric cultures. Further, the interest in the relationships between culture and the natural environment that had its beginnings in the culture area concepts of the ethnologists provided a base for cultural-ecological study. It was during the second subperiod that these concerns with contextual-functional approaches emerged. Willey and Sabloff (1974:130-131) divided the new contextual-functional approaches into three types: 1) the study of artifacts as the material relics of social and cultural behavior, 2) the study of settlement patterns and 3) the study of the relationships between culture and the natural environment.

During the period 1940-1947, Phillips, Ford and Griffin (1951) conducted an archeological survey and test excavation program within the northern two-thirds of the alluvial valley of the Lower Mississippi River - The Lower Mississippi Archeological Survey. The purpose of this survey was to examine the characters of pre-Mississippian cultures and to evaluate the reconstruction of prehistory that Ford had developed for the southern part of the Lower Valley, and to verify its applicability to the north.

During this study no sites were catalogued within 8 kilometers (5 miles) of the study area. Eight were recorded within 16 kilometers (10 miles) of the study area but only two of these are on the west side of the Mississippi River in Arkansas. These two sites are Avenue (3PH3) and Dupree (3PH1) these being about 9.6 kilometers (6 miles) northwest of the study area.

In 1965 John Moselage excavated a house at Dupree (Moselage 1965:1-3). In the same publication McGimsey also reported on this site (McGimsey 1965:3-8). Investigations in the region since the Phillips, Ford and Griffin period are well summarized by Jeter (1982). These studies have mainly been attempts to produce coherent local and regional sequences based on excavations from southeastern Arkansas sites.

The only previous study in the project area has been survey for the Corps of Engineers of levee berm items (McNerney and White 1982). This study reported two historic scatters (3DE77 and 3DE78) and one architectural site (6-C-1) in the present project area. Five other historic sites were reported south of the project area.

Local collectors have reported a number of sites (14) within a 16 kilometer (10 mile) radius of the project area. Of these, only two (3DE18 and 3DE19) appear to fall within the study area. Foremost among the active collectors in the area is Luther Miller of Millwood, Arkansas. Sites have also been reported by Jim Wood of Mosby, Arkansas.

4.0 CULTURAL SEQUENCE

Prehistoric Sequence

Based on research by the Lower Mississippi Valley Survey (Phillips, Ford and Griffin 1951; c.f. Phillips 1970) for the Lower Mississippi Valley archeological area and on research conducted in southeastern Arkansas (Jeter et al 1982; Jeter 1982), a general chronological framework has been established for the Lower White River Basin archeological region (Figure 4-1).

The following sequence is presented by period, in the sense that each broad unit is a period of time during which a specific cultural stage is most representative in the northern portion of the Lower Mississippi Valley and, more specifically, within the Lower White River Basin archeological region. Each period is headed by a traditional eastern United States designation followed by a temporal span suggested by radiocarbon dates and comparative material. When applicable, an additional period designation style follows that of the Arkansas State Plan ((Jeter et al 1982),.

Paleo-Indian Period: -e-8,500 B.C.

The Paleo-Indian period represents the earliest archeological manifestation securely documented on the North American continent. Three distinctive artifact complexes (Clovis, Folsom and Plano) have been documented. These probably represent chronologically successive phases of a single adaptive system which was evident during the late Pleistocene. Fluted Clovis and Folsom projectile points and a variety of unfluted, lanceolate "plano" forms, are the primary diagnostic artifacts associated respectively with these three successive phases.

Paleo-Indian period points are rare in southeastern Arkansas. No points of this period have been reported from Desha County (Jeter 1982:85). Immediately to the north in Phillips County one fluted point has been documented from a site on a Pleistocene terrace (Redfield 1971). Other specimens are known in private collections from the same area, an area that compares environmentally with that of known areas of fluted point concentrations in northeastern Arkansas (Jeter et al 1982:SE 7).

As indicated earlier, Paleo-Indian times were a period when the glaciation of the Woodfordian subage of the Wisconsin Stage was in its final waning stages and when a full glacial vegetation consisting of spruce and/or pine dominated boreal forests was being replaced by a deciduous forest. There is evidence that the shift occurred contemporaneously with the fluted point makers in Arkansas as evidenced by the increase in pollen of oaks and other deciduous taxa between approximately 16,500 B.P. and 13,000 B.P. (Delcourt et al 1980:127).

One major alteration of environmental potential at the end of the Pleistocene is the almost virtual extinction of Pleistocene megafauna. Martin (1967; c.f. Mosimann and Martin 1975) has suggested Paleo-Indian hunters played a role in bringing about this extinction through overkill. Alternative hypotheses suggesting that climatic changes were responsible (e.g. Guilday 1967) are gaining increasing favor, however.

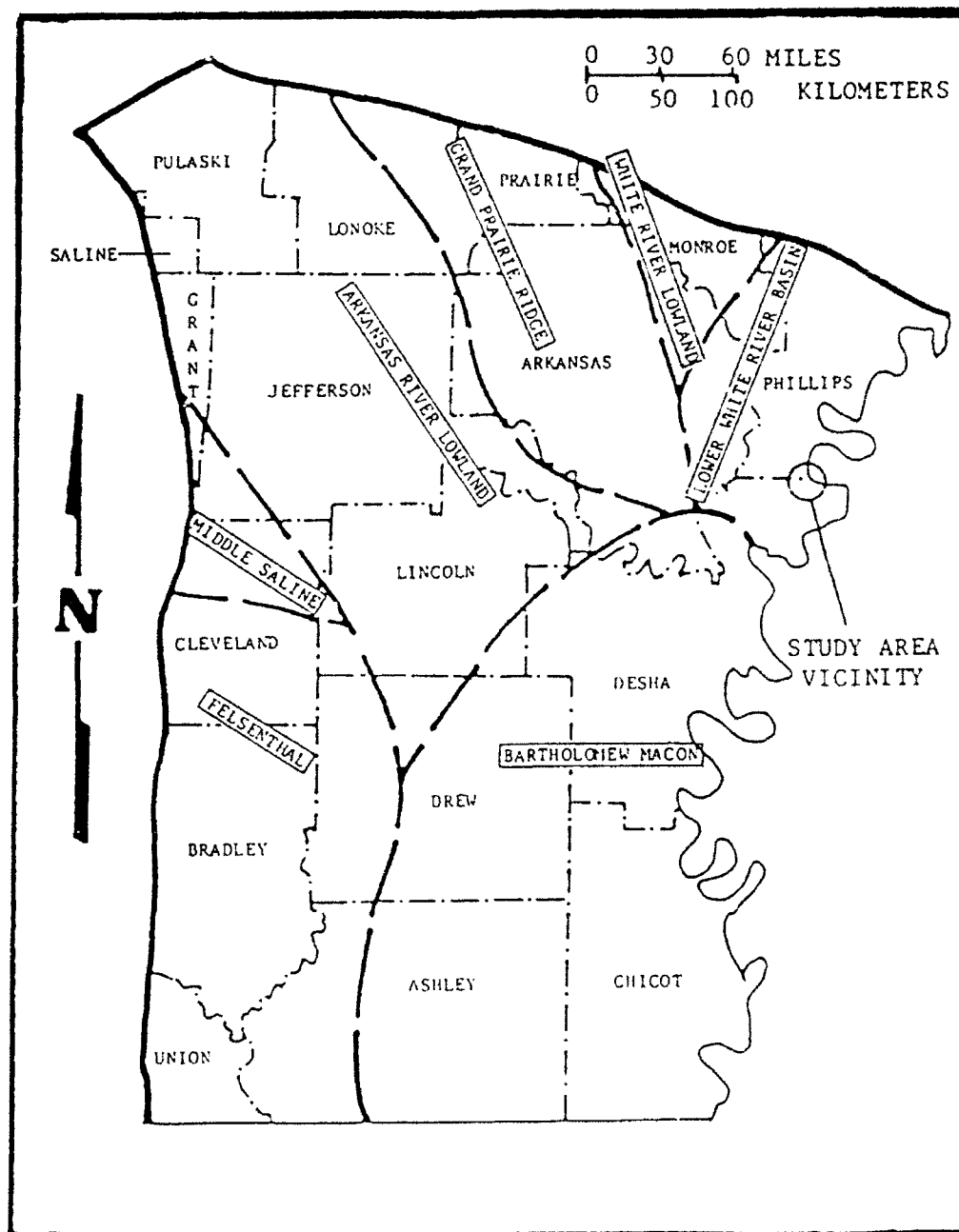


Figure 4.1 Archeological regions Southern and East Central Arkansas

Paleo-Indian cultures were initially characterized as nomadic, big game hunters on the basis of recorded association of Paleo-Indian artifacts with various species of Pleistocene megafauna at sites in the western United States. Paleo-Indians in the East were seen to represent a similar lifeway, even though direct associations had not been recorded. However, excavations at Kimmswick near St. Louis, Missouri in 1980 succeeded in demonstrating a link between Paleo-Indians and extinct Pleistocene mammals in eastern North America (Graham et al 1981). Of even more importance, were the remains of white-tailed deer, cottontail rabbit, marmot, squirrel, weasel, pocket gopher, 13-line ground squirrel and many other species of small mammals found in association with the mastodon remains. This strongly suggests a broad spectrum subsistence strategy incorporating many species endemic to deciduous woodland and meadow habitats. This more generalized hunting and gathering strategy supports the hypothesis that environments supporting Paleo-Indian occupations were becoming increasingly diverse.

Paleo-Indian settlement patterns can only be imagined for southeastern Arkansas. There is, however, evidence that Paleo-Indians of the southeast emphasized the utilization of major river systems. This would indicate that discovery of Paleo-Indian sites would be probable along the margins of the Ouachita Valley, on Macon Ridge overlooking former Arkansas River courses, along the uplands overlooking the western edge of the delta and buried in ancient Arkansas and Ouachita River deposits (Jeter 1982:87).

Paleo-Indian sites in other parts of North America reflect settlement patterns involving multiple, functionally specific site types, including base camps and such special purpose sites as quarries, tool manufacturing sites and animal processing stations (Wilmsen 1970). Studies of sites in the southwest of Paleo-Indian settlement locations suggest that the distributional patterns of these sites were sometimes modified in response to changing environments and circumstances (Judge and Dawson 1972). This implies that flexibility in settlement location might have been an adaptation to fluctuations in late Pleistocene environments, rather than reflecting a nomadic settlement-subsistence system.

It has generally been assumed that Paleo-Indian social organization was at the "band level," but this term is meaningless in view of the extensive diversity exhibited among modern remnants of hunting and gathering societies (c.f. Birdsell 1958; Wilmsen 1973; Wobst 1974). In view of the Paleoenvironmental flux during this period, possibly making important food resources unpredictable, a generalized subsistence strategy and flexible settlement system would have been an adaptive response to these conditions. Yellen (1977) has argued that an anucleate social organization is characteristic of hunter-gatherer adaptations to similarly unpredictable environments. Anucleate bands are not discreet as they maintain extensive inter-band ties via kinship and other mechanisms which allow rapid information dissemination and flexible adjustments in population distributions throughout the territory.

Dalton Period: 8500-7000 B.C.

The most diagnostic artifact of this period is the Dalton projectile point, a form of lanceolate biface belonging to the same technological industry of the preceeding Paleo-Indian period. Dalton artifact assemblages, such as that of the Brand site (3P0139), have been well documented in Arkansas

and consist of a variety of tools reflecting extensive functional diversity. The assemblage includes adzes, spokeshaves, cutting and scraping tools, and ground stone abraders, reflecting the importance of woodworking; bone awls and needles along with scrapers and chipped-stone perforators suggesting hide working; and sandstone mortars, grinding stones and pestles suggesting a reliance on wild plant foods such as nuts, berries and seeds. As of 1974, at least 250 sites in northeast Arkansas have yielded Dalton projectile points (Goodyear 1974:4). Dalton remains are poorly represented in southeastern Arkansas and those that have been found are primarily from the wooded uplands dating to the Pleistocene or earlier (Jeter 1982:88-89; Jeter et al 1982). Further, some Dalton materials have been found on the remnants of ancient terrace surfaces protruding through the Holocene alluvium in the Arkansas River Lowland (Jeter 1982:89). There is also speculation that Dalton materials will be found on Pleistocene or early Holocene surfaces at the eastern margins of the uplands bordering the western edge of the delta (Jeter 1982:89).

The Dalton period environment represented a continuation of early Holocene trends of replacement of the spruce dominated boreal forest as deciduous elements, including oak and elm expanded as post-glacial fluvial systems were adjusting to more modern regimes. A mixed oak environment with numerous ponded relict channels was probably present (Morse 1982:22).

As with the preceding Paleo-Indian period it is assumed that the subsistence strategy was dependent upon a wide spectrum of natural resources. The major large mammal secured for concentrated protein was almost certainly the white-tailed deer (Morse and Morse 1980:1.10). However, faunal remains recovered from the Dalton occupation of Rodgers' Shelter, 23BE125, in southwestern Missouri reflects a supplementary dependence upon raccoon, beaver, rabbits and squirrels, riverine species such as turtle and at least two vegetal resources indicated by hickory and walnut remains (Kay 1980).

Morse (1982:22) suggests the Dalton culture consisted of several cooperating bands, each occupying a major watershed with an upland component. There would have been permanent or major, seasonal base settlements in stable territories with associated hunting, gathering and quarry camps and cemeteries nearby. An alternative hypothesis has been offered by Schiffer (1975). He suggests that the groups of Dalton were indeed territorial but that it is unlikely that they would demarcate their social boundaries with regard to drainage basins "unless it was adaptively propitious to do so." He argues that the banana-shaped basins would not have formed natural liveable units as varying drainage basins do contain varying amounts of the available and exploitable resources necessary for the basic survival of the band. Schiffer (1975:164-256) concludes that these Dalton groups occupied territories which cross-cut major physiographic and/or resource zones, regardless of drainage boundaries.

In view of the continued fluctuations in the environment, the social organization of the Dalton period cultures was probably not substantially different from those of the preceding Paleo-Indian period. Local groups were probably small and the anucleate band organization probably continued. The added element of ceremonialism is now present in the form of Dalton cemeteries.

Early and Middle Archaic Periods: 8000 BC-3000 B.C.

Post-Dalton period artifacts in southeastern Arkansas range from rare to nonexistent during this period (Jeter 1982:85). They suggest there was minimal human activity within the Mississippi Alluvial Valley in contrast to a great deal of activity in the Ozark Highlands to the north, the Ouachita Mountains to the west, and within the Tennessee uplands to the northeast. In southeast Arkansas early Archaic point forms are found on the same types of land surfaces as those that contain Dalton points (Jeter 1982:89). No Early Archaic sites have been reported in Desha County.

House (1980) reports that basal notched point types resembling Eva, Marshall and Calf Creek points indicate Middle Archaic Occupations in eastern Arkansas. Rolingson (1974) found Johnson points in southern Arkansas at sites believed to be Middle Archaic. However, no Early or Middle Archaic sites have been reported in the Mississippi Alluvial Valley (Jeter 1982:85). Possibly, as is promulgated for northeastern Arkansas (Morse and Morse 1980:1-11), populations during these periods moved from the lowlands to the uplands. Morse and Morse (1980:1.11) suggest a major climatological change was responsible for this shift in population demographics. As noted earlier, the Hypsithermal (6,700-3,000 B.C.) occurred during this period, producing drier conditions and lowered water tables and a corresponding shift from forests to grasslands (King and Allen 1977). In addition, several major drainage shifts probably took place during this period: 1) the eastern braided channels of the Mississippi River changed to a meandering channel, 2) the St. Francis River was rerouted from the Cache Basin into the Eastern Lowlands through a gap in Crowley's Ridge and 3) the Black River was rerouted from the Cache Basin, westward to along the Ozark highland escarpment (Morse 1982:22).

Archaic culture is generally conceived of as a series of hunting and gathering lifeways that were adapting to changing Holocene environmental conditions. It is assumed these groups practiced a subsistence economy based on the seasonal movement of related, mobile bands between a variety of geographical or physiographic zones, based on the seasonal availability of flora and faunal resources in any given zone.

Late Archaic (Poverty Point) Period: 3000 BC-500 B.C.

A wide variety of Late Archaic point types (Gary, Evans, Williams, Marcos, Palimallas, Bulverde and Delhi) have been found on most land surfaces in southeastern Arkansas (House 1980; 1982). Groundstone tools appear infrequently on Archaic sites in southeastern Arkansas although the distinctive lapidary items of the Poverty Point culture appear occasionally in sites in the southern portion of the area (Jeter et al 1982:SE 13).

Data about this period are still lacking for Desha County and no sites with Late Archaic components have been recorded for the county as of 1980 (Jeter 1982:85).

As noted earlier, the climate during this period was experiencing an increase in available moisture, although conditions still remained relatively drier than those experienced before the Hypsithermal. As a result, there was a decrease in grasslands and an expansion of the deciduous forests.

The subsistence strategy during this period may have depended, to some degree, on horticulture of native and tropical cultigens. Theories concerning the origins of agriculture in the eastern United States can be split into essentially two types: 1) those that argue that an indigenous agricultural complex was domesticated first and included such common species as lambs-quarter, pigweed, marshelder and sunflower (Fowler 1971; Struever and Vickery 1973) or 2) those that argue the occurrence of cucurbits at several Late Archaic sites preceded the appearance of domesticated native plant species (Chomko and Crawford 1978). Recent data from Phillips Spring leaves little doubt now that squash and gourd were the initial domesticates (Kay et al 1981). However, it must be remembered that, even with the introduction of horticulture, the subsistence strategy was still essentially one of hunting and gathering based upon a broad spectrum of natural resources.

The settlement pattern tends to reflect this dependence upon a broad spectrum of resources. House (1973) has hypothesized a basic settlement system in which a small group moves within a single minor drainage so that the maximum environmental diversity within a small area is exploited by a pattern of seasonal habitations. It is not known how widespread this basic settlement system was, or what kinds of alternative systems existed. However, studies along the Ozark Escarpment suggest a seasonal shift from the lowlands, up a narrow stream valley, and back again (Morse and Morse 1980:1.12). This is essentially a semi-sedentary settlement pattern with some degree of tethered mobility reflecting a seasonal round.

Little is known about the social organization of this period although the basic pattern suggests a probable tribal organization in contrast to the earlier anucleate band system. This shift in social organization could have been in response to increased sedentarism and group size as suggested by Morse (1969:19) for the Frierson phase, based upon the large number of habitation mounds occurring.

Woodland Period (500 B.C. - A.D. 700)

The Woodland period (300 BC - AD 1000) is differentiated from the Archaic on the basis of three chronological or technological indicators: the use of the bow and arrow, indicated by the presence of small projectile points, the appearance of ceramics and the introduction of agriculture, reflected in the archeological record by a change in tool type (e.g., hoes and digging implements) and/or a shift in areas preferred for settlement (areas of more or arable soil).

Early Woodland (Tchula) Period: 500 B.C. - 100 B.C.

Tchula sites are few and scattered in southeastern Arkansas. As a result the period is not well defined and little is known of the settlement or subsistence systems. Information from the north and the south suggests that social organization was organized on the tribal level during this period to allow for variations in the environment. These would have exhibited a wide range of variance with groups being small or large, cohesive or noncohesive, settled in compact villages or neighborhoods, poorly developed or highly developed, with the ability to migrate out of or into different regions (Morse and Morse 1980:1.13).

Middle Woodland (Marksville) Period: 100 B.C. - A.D. 300

Marksville is the regional manifestation of a widespread complex, known elsewhere in North America as Hopewell. Identification of Marksville period components is based upon distinctive ceramic markers such as broad U-shaped incised lines; zoned dentate stamping and zoned rocker stamping both plain and dentate. Horizon markers for dating within the period include the "Hopewell" rim and the characteristic bird motif of early Marksville, and the compressed meanders and "flower-like" motifs of late Marksville times (Phillips 1970: 886).

According to Haag (1971:17) this culture originated in the Ohio River Valley and spread southward from Ohio and Illinois. The period is named for the Marksville site (16AV1), the type site located in Avoyelles Parish, Louisiana. As noted above, the period is characterized by the introduction of very fine pottery, as well as well-made projectile points that appear to have been manufactured primarily for use as grave goods. There is a continuation, in the Marksville period, of Poverty Point concern with mounds and great earthworks, as well as the addition of elaborate burial techniques. Marksville culture is similar to other Hopewell manifestations, throughout much of the eastern part of the United States, in that there is a pronounced concern with mortuary ritual. Exotic grave goods such as copper beads, pipes, raw, rare materials, and conch shells from the Gulf are common (Haag 1971:18).

The Hopewellian concept of mortuary ritual was adopted throughout much of the eastern United States by indigenous cultures, defining the Hopewellian Interaction Sphere. To the north, there is a classic Marksville site near Helena, Arkansas and, south there are abundant Marksville sites which constitute the typical Hopewell of the southern Mississippi Alluvial Valley.

Subsistence strategies of this period are generally consistent with the preceding period. Hunting and gathering of natural resources continue to be important economic activities. In addition, horticulture was continued with both native and tropical cultigens. However, Haag (1971) suggests there not enough evidence to support a hypothesis of maize as a true staple in Marksville times. He suggests it was probably a dietary supplement.

The settlement systems of this period were probably a continuation of the preceding period. This system would have centered around a semi-sedentary adaptation consisting of summer and winter base camps with associated special activity sites.

The social organization of this period was almost certainly one of some form of ranked social organization. This is implied by the concept of "honored dead" of the Marksville mortuary ritual. Characteristic of this concept of ceremonialism is the fully evolved concept of burial mound, represented by groups of two or more relatively large, conical mounds that contain a series of tombs or burials of select peoples. However, burials of any kind in Marksville mounds are, in general, sparsely supplied with burial furniture or any accompanying artifacts (Haag 1971:18).

Late Woodland (Baytown) Period: A.D. 300-A.D. 700

The general disappearance of the Marksville traits from the archeological record marks the beginning of the Baytown period in southeast Arkansas. Baytown cultures in southeastern Arkansas are poorly known, despite the fact the type site Baytown site 3M01 is in the White River Lowland. Within 16 kilometers (10 miles) of the present project area several Baytown sites have been recorded. Notable among these is the Dupree Site (3PH1; PFG 16-L-6).

In southeastern Arkansas, site distribution shows that the bottomland terrain was selected, with sites being placed on the natural levees of streams. Many of these sites appear to be large (small sites are difficult to recognize), and the depth of deposits suggest an increasing stability of populations with complex forms of politico-religious organization. Some of the mounds may well be platform mounds instead of, or perhaps in addition to, burial mounds (Jeter et al 1982:SE 30).

Slightly to the north Baytown period sites are frequent and widespread occupying the full range of landforms available. Further, sites in this area appear to include small middens and large and small low density sherd scatters. None of these sites appear to be large villages with long spans of occupations (House 1982:42).

Diagnostic traits for the period are ceramic. These include a greater percentage of Larto Red Filmed and Mulberry Creek Cord Marked and the presence of Alligator Incised, Salomon Brushed and Indian Bay Stamped. Vessels commonly have large, heavy thick walls. Sites may have conical or dome shaped mounds. Lithics include small slender varieties of Gary stemmed projectile points (Jeter et al 1982:SE 28).

Subsistence strategies during this period probably involved an increased reliance upon horticulture, although hunting and gathering activities (perhaps on a seasonal basis) would have provided a substantial percentage of the total food supply. Research conducted in northeastern Arkansas concerning settlement dates from the Zebree site (3MS20) and from a survey designed to identify sites in relationship to environmental zones suggest that during the winter, groups of up to four different households would congregate in a winter village. During the rest of the year they would fragment into individual households. Presumably, during the winter, hunting and gathering activities would provide the major portion of food while, during the summer, increased effort would have been assigned to horticultural activities (Morse and Morse 1980).

Mississippian Periods (A.D. 1600)

The Mississippian period commences with the emergence of the Mississippian culture in the northern part of the Lower Mississippi Valley and Plaquemine culture in the south. The generally accepted date is circa A.D. 1000 for Early Mississippian. The culmination of the period coincides with European contact.

Early Mississippian (Coles Creek) and Middle Mississippian Periods
(A.D. 700 - A.D. 1350)

The Early and Middle Mississippian periods are not well understood in the Lower White River Basin. Sites in the Lower White River Lowland and Basin include Menard, Almond, Massey, Poor, Wynn, Baytown, Cook, Alma Brown and Roland. Work has been done by Phillips (1970) and Scholtz (1971) and Baker (1974).

Sites of this period are found on the full range of land forms and their distribution is not circumscribed within the large floodplains (House 1982:44). Sites of the Coles Creek period are characterized by low density sherd scatters and middens. Platform mounds occur in both periods and in some cases have a definite truncated pyramidal shape. However, none appear to have been associated with large nucleated villages. It is assumed that the appearance of these mounds represents the increasing importance of social integrative institutions on a level higher than local residential groupings (House 1982:42).

Diagnostic artifacts for the Coles Creek Period are Coles Creek Incised ceramics, grog tempered plainware and small arrow points such as Scallorn, Rockwall, Agee, Homan and Bonham (Jeter 1982:100-101; House 1982:42). The Mississippian period is characterized by shell tempered plainware (House 1982:42).

In contrast to the distinctive changes that take place between the Marksville and Baytown cultures, the division of Coles Creek from the preceding Baytown appears to be a rather arbitrary line in a developmental sequence that exhibits considerable continuity (Jeter et al 1982:SE 32). If true, the settlement and subsistence systems of the Northern Coles Creek culture should exhibit little difference from those of the preceding Baytown culture. Further, the distinction between Coles Creek and Middle Mississippian appears to be one based in a dramatic discontinuity of ceramic tradition (grog to shell tempered ceramics) rather than discontinuities in community form and settlement patterns (House 1982:42).

Late Mississippian (Old Town and Quapaw) Period (A.D. 1350 - A.D. 1600)

This period is not well understood in the Lower White River Basin and much of the information is based on the cultural sequences developed by Phillips (1970) for the Lower Mississippi Valley. Several phases have been postulated for the general area, but these are still tentative.

In northern Desha County the applicable phase, the Old Town Phase, is characterized by its originator Phillips as "a completely dubious set up necessitated by the fact that the famous Old Town works... and a handful of other components in the area have no other place to go," (Phillips 1970:940).

These late phase sites are poorly known and are documented only from early investigations in the area (Moore 1911), reconnaissance data and materials in private collections. The Old Town site has been largely destroyed by levee construction. Other sites such as Avenue and Dupree have been nearly obliterated by agricultural practices in the area.

The bulk of the Old Town artifact assemblages points to a time span of A.D. 1400 to A.D. 1600. This assemblage is made of various late Mississippian ceramic types and has produced polychrome and effigy forms and Wallace Incised (House 1982:SE 66). Phillips (1970:940) notes the absence of Bell Plain in collections. Also present are extended burials, many in bark coffins, earthen embankments and temple mounds (House 1982:SE 66).

The definition of the Quapaw phase is complicated by the existence of considerable variability among Quapaw phase sites in ceramics, burial patterns, and house patterns. The occurrence of "Caddoan," and in the case of the Menard site, "Natchezan" vessels in graves on Quapaw sites adds considerable ambiguity to the geographic boundaries of the Quapaw phase. Further, the distribution of the archeological Quapaw phase corresponds very poorly to the location of the four ethnohistorically-documented late seventeenth century Quapaw villages (Jeter et al 1982:SE 79).

To further confuse the temporal span of the Quapaw is ambiguous. The Quapaw's origin legends states there were newcomers to the Lower Mississippi Valley, their traditional home being in the Ohio Valley. There is linguistic evidence suggesting that the early historic Quapaw were at a much less complex level of sociopolitical organization than were the early eighteenth century Natchez and the sixteenth century west Arkansas groups described in the DeSoto expedition chronicles, lending further support to the hypothesis that the Quapaw were late-comers to the Mississippi Valley (Jeter et al 1982:SE 80). Evidence favoring an alternative hypothesis that the historic Quapaw are descended from late prehistoric Mississippian peoples within the Mississippi Valley include the mound-plaza community plans at a number of Quapaw phase sites, and artifact-style commonalities between the Quapaw phase and the Kent and Parkin phases and other late prehistoric-protohistoric units in the Mississippi Valley (Jeter et al 1982:SE 80).

The Avenue site (3PH3) near Millwood, Arkansas has produced Quapaw phase-like bowls and bundle burials (Moore 1911:401). For this reason Phillips has included it in the Quapaw phase.

Concerning contact period sites, Phillips (1970:19) remarks that as the "DeSoto Entrada" left no discernible traces in the archeology of the Lower Mississippi Valley; one could hardly set the contact period before the seventeenth century." However, this is not entirely true for the Lower White River Basin archeological region as the DeSoto Entrada traveled through the area on its way to the Arkansas River.

Historic Activity Periods

The periods used in this study are generally based on Stewart-Abernathy's proposal in the Arkansas State Plan (Stewart-Abernathy and Watkins 1982: H1-57). However, not all periods are applicable to the area studied and as dates as used by Stewart-Abernathy and Watkins (1982:H19) do not follow the historical events as found in the area, divergences from his plan will be made in order to make this study more meaningful and comprehensible.

Indirect Contact Period (A.D. 1500 - A.D. 1660)

The Indirect Contact period (AD 1500-1660) was the interval when interaction between Europeans and Indians was primarily second hand. The major exception to this, within the state of Arkansas, was the DeSoto Entrada.

In 1541, the Spanish explorer DeSoto and his army crossed the Mississippi River into Arkansas, where they entered the province of Aquixxo, then traveled north through the lands of the province of Casqui to the main town of the province of Pacaha (Phillips, Ford and Griffin 1951:352-361). Pacaha was apparently the major political unit in the region (Morse 1969:24). Archeologically Pacaha should include the Pecan Point and Wilson area (Morse 1969:24). The province of Casqui may be the cluster of sites of Late Saint Francis/Wells-Pecan Point type on Bradley Ridge northwest of West Memphis.

Villages are described as being well built with temple mounds and stockades being present. The principal village of Pacaha was partially surrounded by a moat and had an island retreat which was used by the population upon DeSoto's appearance (Phillips, Ford and Griffin 1951:357).

The location of DeSoto's crossing point is debated. Three alternatives have been proposed: 1) Sunflower Landing, half-way between the mouth of the Arkansas River and Helena; 2) Commerce Landing about half-way between Helena and Memphis and 3) Memphis (Davis 1966:6). Swanton (1939) favors the southernmost Sunflower Landing, while Phillips, Ford and Griffin (1951) favor, on archeological grounds, the Commerce Landing crossing. More recently, Perino (1966:140) has suggested that archeological and geographic data from the Wapanocca Lake area, northwest of Memphis, suggest to him the northernmost Memphis crossing. The Belle Meade site (3CR30), approximately 75 miles northeast of the study area, has also been considered as possibly being the great Pacaha village (Brain, Toth and Rodriguez-Buckingham 1972). Swanton places the province of Aquixo near the Avenue Site (Swanton 1939:291). According to Phillips, Ford and Griffin this site is too far south of Sunflower Bend to have been the location of this aboriginal province (Phillips, Ford and Griffin 1951:375-376).

Direct Contact Period (A.D. 1660 - A.D. 1720)

The Direct Contact period was the interval when regular personal contact developed between Europeans and Arkansas Indian Groups. In 1673, Father Marquette and Louis Joliet traveled down the Mississippi River from French Canada as far south as the Quapaw village of Arkansia (Phillips, Ford and Griffin 1951:396-397). There having learned that the Mississippi flowed into the Gulf of Mexico 10 days journey away and that the lower river was infested with hostile Indian groups the French expedition turned back up the river (Severin 1968:99).

There is evidence that during the 132 years that elapsed between DeSoto's first entry into Arkansas and Marquette and Joliet's travels, the Indian population decreased at least 80 percent (Phillips, Ford and Griffin 1951:419). The only group encountered in eastern Arkansas by this expedition were the Quapaw in the vicinity of the Arkansas River. Cultural disintegration and political decentralization accompanied the population decline. Phillips, Ford and Griffin (1951:420-421) attribute the population loss to the aggressive

nature of the Chickasaw. Morse (1969:24) adds to this possibility the introduction of European diseases to the aboriginal population and also the possible disruption of the Indian economic system caused by European consumption of stored agricultural produce.

In 1682, a second French expedition led by LaSalle traveled down the Mississippi River. Stopping near Memphis along the Chickasaw Bluffs, contact was made with some Chickasaw (Phillips, Ford and Griffin 1951:400). In March, they arrived at one of the Quapaw villages previously visited by Marquette and Joliet. In April, the expedition reached the Gulf of Mexico, and LaSalle claimed the entire Mississippi drainage for France.

In 1686, a second expedition led by LaSalle set out to locate the Mississippi River mouth via the Gulf of Mexico. DeTonti, LaSalle's lieutenant, left Fort Saint Louis on the Illinois River to descend the Mississippi River and meet LaSalle at its mouth. Unknown to DeTonti, LaSalle missed the Mississippi River mouth, landed in Texas and was murdered by his own men. DeTonti, after waiting for LaSalle, returned upriver. At the mouth of the Arkansas, he left several men to establish what was the first permanent settlement in Arkansas (Phillips, Ford and Griffin 1951:403-405).

With the establishment of DeTonti's Post of Arkansas in 1686 contact was formalized and intensified. The potential and actual effects of this contact are as yet unexamined in the state, with few of the contemporary Indian sites documented (Stewart-Abernathy and Watkins 1982:H21). European trade materials have been found at Dupree just north of the study area (Luther Miller 1983: personal communication) which may indicate interaction with Europeans by the peoples of this and the surrounding area.

Coexistence Contact Period (A.D. 1720 - A.D. 1770)

The Coexistence Contact period was the period when Indian behavior was modified as a response to European actions, brought about by the permanent nature of European occupation and the gradual incorporation of Indian activity into European economic and political subsystems. It was characterized by the increasing adoption (and transmission to the archeological record) by Indians of European goods involving subsistence and syncretized religious, political and social symbology. The interaction of European and Indian was often so close that it may not be possible to segregate campsites of French hunters from those of Indian hunters, since many of the hunters, after a generation or two of intermarriage, were both (Stewart-Abernathy and Watkins 1982:H22-23). However, not all of these contacts were peaceful as evidenced by the description of the hostilities between Bienville and the Chickasaw in 1740 (Nuttall 1821:288-289).

Evidence for the occupation of the study area during this period has not been discovered.

Resettlement Contact Period (A.D. 1770 - 1840)

The Resettlement Contact period (A.D. 1770-1840) was the interval when Indian activity became more circumscribed by European. Indian cultural and territorial patterns were disrupted by population loss and consolidation into

single entities, and the eventual loss of all land claims and removal of organized groups westward into Indian Territory (Stewart-Abernathy and Watkins 1982:H23).

By the late 1700's, increasing pressure from Euro-American settlers in the eastern United States, as well as the intrusion of the Spanish in the Arkansas territory caused several Indian groups to migrate into the territory (Faye 1945). The Kaskaskia, led by their hereditary chief, Jean Batiste du Doighe, moved into the Arkansas River region in the late 1770's. Other groups which moved west included the Delaware, Osage, Miami, Choctaw, Peoria and Chickasaw.

In 1821 the Quapaw ceded their territory to the U.S. Government and agreed to move to the Caddo country on the Red River (southwest Arkansas area). However, the land they moved to was frequently flooded resulting in destruction of their crops and sickness. As a result, they returned to their old country, but the white settlers annoyed them so much that in 1833 the United States Government ceded to them 150 sections of land in southeastern Kansas, to which they moved (Swanton 1946:176).

In 1832 the United States began construction of what was called the Military Road. This road ran from Memphis to Little Rock and was constructed for the purpose of moving Indians from the eastern states to the western reservations (Woolfolk n.d.:2). As well as moving the tribes by land to the west, groups were embarked at Memphis and moved by boat down the Mississippi. These people then were moved up the White River to the Arkansas to Oklahoma. The port of entry into Arkansas was Montgomery Point, located on Victoria Bend on the Mississippi River adjacent to the point where the White River flowed into the Mississippi (Hobson 1978:1-10). By 1840 the Indians, as organized groups, were gone from Arkansas, leaving only individuals who remained as hunters, squatters, and legitimate landowners (Stewart-Abernathy and Watkins 1982:H24).

European Period (A.D. 1500 - A.D. 1825)

This is the period when non-Indian cultural patterns in operation in Arkansas derive primarily from Continental Europe.

Spanish Period (A.D. 1500-1700)

The Spanish period was the interval when sites were occupied by Spaniards with an attendant material culture, carrying out basically non-Indian behavior. There are probably less than 50 such sites, including the actual wintering places and temporary campsites of the DeSoto Entrada (Stewart-Abernathy and Watkins 1982:H25).

Sites of the early Spanish period, if present, would almost certainly be associated with the DeSoto Entrada. Since DeSoto did not winter in this area, they would consist of campsites.

After 1762 when France ceded to Spain all her lands west of the Mississippi River, Spanish rule lasted until 1801 when Spain, by secret treaty, gave Louisiana back to France. Just two years later in 1803 France sold Louisiana to the United States. However, during the two years France owned Louisiana again, Spanish officials continued administering the territory.

While the territory was under Spanish rule, settlement by Spaniards was encouraged by the practice of granting tracts of land to individuals who had served the Spanish government. However, early settlement was slow. Kniffen (1971:49) estimates that only approximately 2000 people lived between New Madrid, Missouri and the Arkansas River at the time of the Louisiana Purchase, while south of the Arkansas the population figure approximated 34,000.

Although the project area is located along the main channel of the Mississippi River no Spanish settlement took place in the area. Land in this region was not settled until the 1820's and 1830's when land was offered for sale by the United States.

French Period (A.D. 1700 - A.D. 1825)

The French period (A.D. 1700-1825) was the interval when the French created and maintained the dominant European cultural landscape. This landscape consisted of two types of settlement patterns: 1) relatively high density settlements at roughly known village or hamlet locales (such as DeTonti's Post of Arkansas) based on subsistence agriculture and commerce and 2) extremely low density settlement areas consisting of camps and relatively impermanent structures (such as used by French hunters and traders) based on exploitation of faunal resources and low level exchange with the Indians. Both types of settlements are associated with the extensive river network of Arkansas (Stewart-Abernathy and Watkins 1982:H27). It was also during this period that Benard de la Harpe traveled up the Arkansas River in 1722 under orders from Bienville to make alliances, through presents, with Indians and to announce to any Spanish he might meet that they were in French Territory. French control of the Arkansas lasted until France ceded all her lands west of the Mississippi to Spain in 1762. No known French settlements have been located in the study area.

Anglo American Period (A.D. 1780-Present)

This is the period (A.D. 1780-Present) when people with a British heritage, plus an amalgamation of Eastern seaboard traditions, transformed the preexisting Indian and European cultural landscape into one keyed to agriculture that remained stable for over a century.

Pioneer Period (A.D. 1780 - A.D. 1850)

With the Louisiana Purchase in 1803 the Mississippi Valley was opened to widespread settlement. Travelers and settlers moved westward into the new lands. Guides such as Zadok Cramer's (1814) Navigator informed emigrants and excursionists of what they might find. Others such as Nuttall (1821) and Flint (1826) wrote of their experiences in the "western" lands.

The Pioneer period (A.D. 1780-1850) was the interval when the first wave of Anglo-American landscape organization was initiated. By the end of the period, nearly all of the useable landsurface (defined in terms of extant levels of technology and production) is marked by at least medium density mixed farming (as yet unquantified) and established political, judicial and commercial institutions geared to the support of an overwhelmingly rural and largely yeoman population. Between about 1800 and 1840 the state population increased from under 1000 to about 97,000, with the greatest increases between

1840 and 1860 (209,000 people present in 1850 and 435,000 in 1860) (Ferguson and Atkinson 1966). The increase in population in Desha County (Table 4-1) reflects the general population growth of the state.

TABLE 4-1. Growth of population in Desha County, Arkansas from 1840 to 1900

DATE	POPULATION
1840	1,598
1850	2,911
1860	6,459
1870	6,125
1880	8,973
1890	10,324
1900	11,511
(From Dhona 1980:c)	

This increase was mainly the result of a program of Congress that provided every man who had a family land if he would reside there and perform the duties of a citizen for those years. Each person was issued a conditional certificate for the acreage he was entitled to settle and, after fulfilling the conditions of the certificate, was then issued an unconditional certificate which he delivered to the county surveyor. The surveyor then surveyed-out, from the public domain, the required number of acres, including the improvements of the settler. The certificate, along with the surveyor's notes, was then sent to the General Land Office in Little Rock, Arkansas and a patent was issued to the settler and the land became his. Table 4-3 lists the original land patents in the study area. The land claim dates range from A.D. 1834 to 1858.

TABLE 4-2. Original land claims in the Knowlton study area

DATE OF CLAIM	CLAIMEE	ACREAGE	LOCATION (to nearest 1/4 section)			
			T	R	S	QUARTER
3-2-1834	Abel and Cephas Knowlton	166.79	7S	2E	5	SW fr. 1/2 & SE fr. 1/2
5-23-1834	Jeremiah Evans	149.92	7S	2E	6	E fr. 1/4
7-5-1834	Abel Knowlton, Jr.	160	7S	2E	8	W4
7-30-1834	John S. Clayton	160	7S	2E	20	E2, SW4, & W2, SE4
9-15-1834	Nancy Smith later Hudson	320	7S	2E	6	SW4 &
			7S	2E	7	NW4
9-15-1834	Richard C. S. Brown	316.2	7S	2E	8	SW4 & NE fr. 1/4
9-30-1834	Maurice Rulong	320	7S	2E	17	SW4 &
			7S	2E	20	NE4
4-20-1834	Miles and Stephen Knowlton	320	7S	2E	17	NW4 &
			7S	2E	6	SE fr. 1/4
7-21-1835	Solomon G. and George W. Nichols	160	7S	2E	20	E2, SE4,
8-21-1835			7S	2E	20	W2, SW4
2-19-1836	William Evans and William Pritchett	159.84	7S	1E	1	E2, NE4 & E2, SE4

TABLE 4-2. Continued

DATE OF CLAIM	CLAIREE	ACREAGE	LOCATION (to nearest 1/4 section)			
			T	R	S	QUARTER
3-16-1836	Margaret Holloway and Stephen Isham	80	7S	2E	17	W2, SE4
3-16-1836	John and John S. B. Royall	80	7S	2E	20	E2, NW4
6-14-1836	Jno. and Jno. S. Barnes	80	7S	2E	6	W2, NW4
5-24-1838	Hugh Simpson	320+	7S	2E	8	SE4 & NE fr. 1/4
5-24-1838	Tule R. Murad	160	7S	2E	21	NE4
10-18-1838	William Roberts	160	7S	2E	7	SE4
10-25-1838	Abel Knowlton	240	7S	2E	7	W2, NE4
10-26-1838			7S	2E	20	W2, NW4
12-4-1838			7S	2E	7	E2, NE4
10-26-1838	Thomas D. Carmal	100.14	7S	2E	6 5	E2, NW4 & NW fr.
1-17-1842	Horace Peck	26.37	7S	2E	15	Fragment
7-29-1846	Horace Peck	80	7S	2E	7	NE4, SW4 & SE4, SW4
12-5-1846	John Walker Cooper	40	7S	2E	17	SE4, SE4
1-4-1847	William P. Warfield	160.99	7S	1E	1	W fr. 1/2 of E fr. 1/2
1-4-1847	John G. Griffiths and William P. Warfield	79.58	7S	1E	1	SW4, NW4 & SW4, SW4
7-3-1847	Seri Harrison	40	7S	2E	17	NE4, SE4
6-12-1848	William and Nelson P. Johnson	42.62	7S	1E	1	NE fr. 1/4 of NW fr. 1/4
6-1-1858	Thomas Hawkins	40	7S	1E	1	SE4, SW4
		3966.45				

Seventy-six and four tenths percent of these holdings were claimed in the 1830's and the final claim was filed in 1858 (Table 4-3). Further, of the 4,209.42 acres in the area tabulated, only 242.97 acres or 5.77 percent was listed as swamplands. This is most likely a function of the fact that 94.23 percent of the land in the area was claimed by 1850 the year of the Swampland Act in Arkansas. In 1830 when the area was surveyed, N. Rightor (1830) the surveyor found a number of people already settled in the study area (Figure 4-2). These included Abel Knowlton and the Widow Evans whose names (Jeremiah is probably the widow's son) later appear in the land claims records. Of the others mentioned by Rightor, their names do not appear and it is assumed that they left the area. The largest landholders in the area were the Knowlton family who laid claim to 886.79 acres or 22.35 percent of the claimed land.

The village of Knowlton grew up around their holdings. In 1830 Abel Knowlton had a woodyard along the bank of the Mississippi (Rightor 1830:11). This yard was supervised by a Mr. Grissum who also had a house in the vicinity (Rightor 1830:12). Since the 1830's the Mississippi River has eroded most of Knowlton away and today the river's course is approximately 609.5 meters (2,000 feet) west of where it was in 1830 (Figure 4-2).

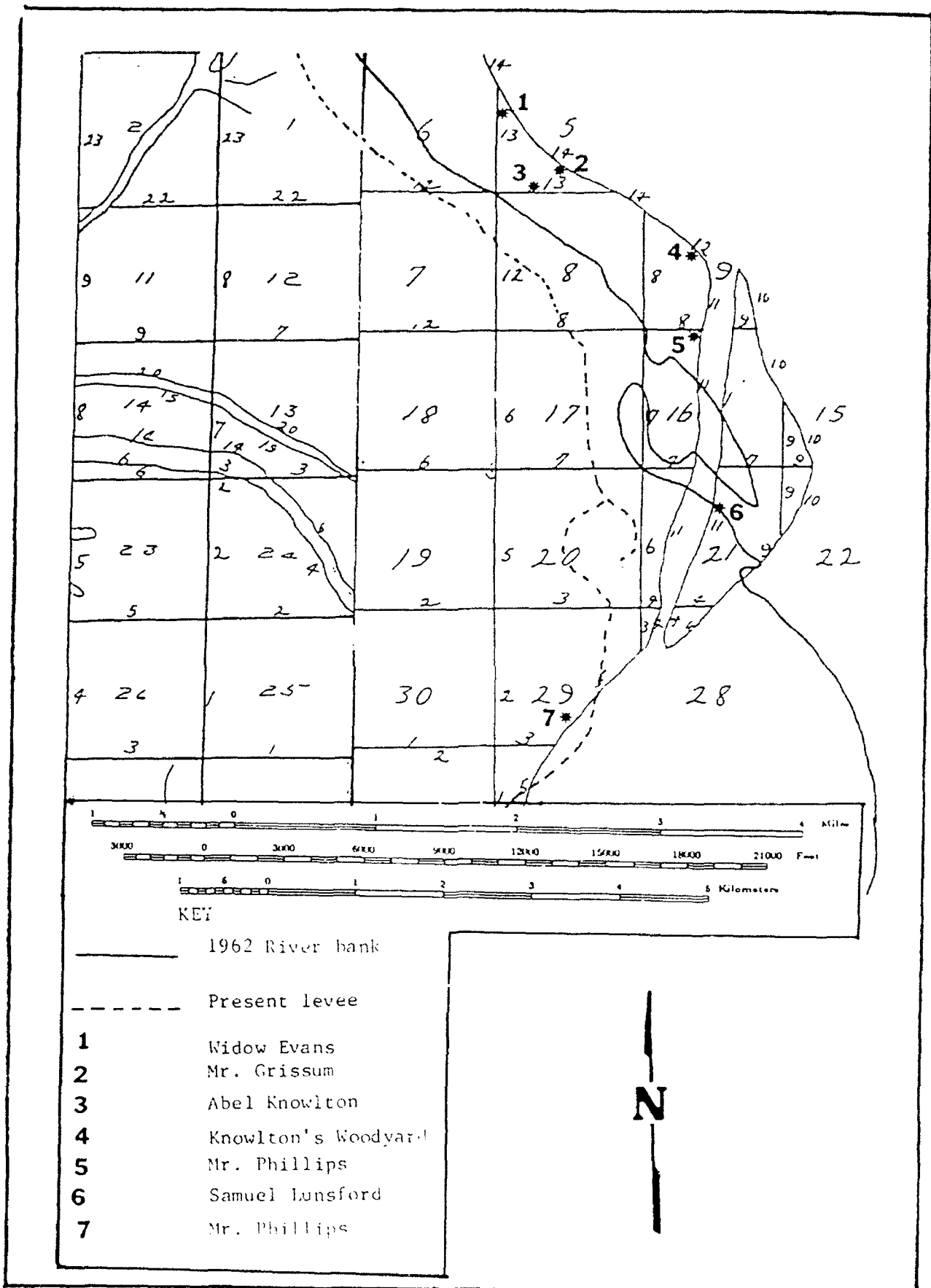


Figure 4.2 Pioneer settlers in the Knowlton area, 1830 (from Righter 1830)

TABLE 4-3. Number of Claims and Percent By Year in the Knowlton Area.

DATE	NUMBER OF CLAIMS	PERCENTAGE
1834	11	29
1835	4	10.5
1836	5	13.2
1837	9	23.7
1842	1	2.6
1846	3	7.9
1847	3	7.9
1848	1	2.6
1858	1	2.6
TOTAL	38	100

By the end of the Pioneer period, 1850 Cephas Knowlton is listed as one of the largest slaveholders in Desha County (Walz 1953). The Knowltons continued to live in the area until the 20th century when the last descendents moved to Memphis.

Plantation/Tenant Farm Period (A.D. 1800-Present)

The Plantation period and its subset, the Tenant Farm period, is the interval when a specialized form of commerce/agriculture was practiced, requiring high input of capital (in the form of slaves, then tenantry and now high technology and agrichemicals) in combination with monoculture of an annual crop (i.e., cotton) on large acreage to create an integrated social, political and economic entity. Intra-plantation settlement patterning usually moved from nucleated (plantation headquarters with adjacent slave quarters), to dispersed (tenant farmsteads spread across the plantation holdings), back to nucleated (plantation headquarters with mechanized equipment sheds with farm laborers houses nearby) (Stewart-Abernathy and Watkins 1982:H31).

During the 19th century the major land holdings in the study area were held by the Knowltons and Beiths. By 1882 a sizable community known as Knowlton had grown up around Knowlton's landing (Figure 4-3). This community had a post office, doctor, stores, mills and church and cemetery. By 1890 Robert A. Beith, who had immigrated from Scotland, had become prominent in the area owning 1,600 acres with 350 of them cleared (Goodspeed 1890:1007). By this time the post office had removed to Beith's Landing just downriver from Knowlton and there was a steam corn mill and cotton gin as well a clergyman, Justice of the Peace, doctor and general store. The population of the hamlet was 50. Another outstanding citizen of the area during this period was Alford Knowlton. This Knowlton was unique in that he was a free man of color who owned 352 acres and a combined steam and grist mill (Goodspeed 1890:1028). Several of the settlers in the project area were from Connecticut. Although they owned slaves they also had free coloreds attached to their households in the 1830 and 1850 censuses. All free coloreds in Desha County resided in Mississippi township and were attached to a Knowlton or Browne household (U.S. Census Records, Arkansas County 1830; Desha County 1850). Evidently Alford Knowlton took advantage of his opportunities and became a respected and influential citizen in the area (Goodspeed 1890:1028).

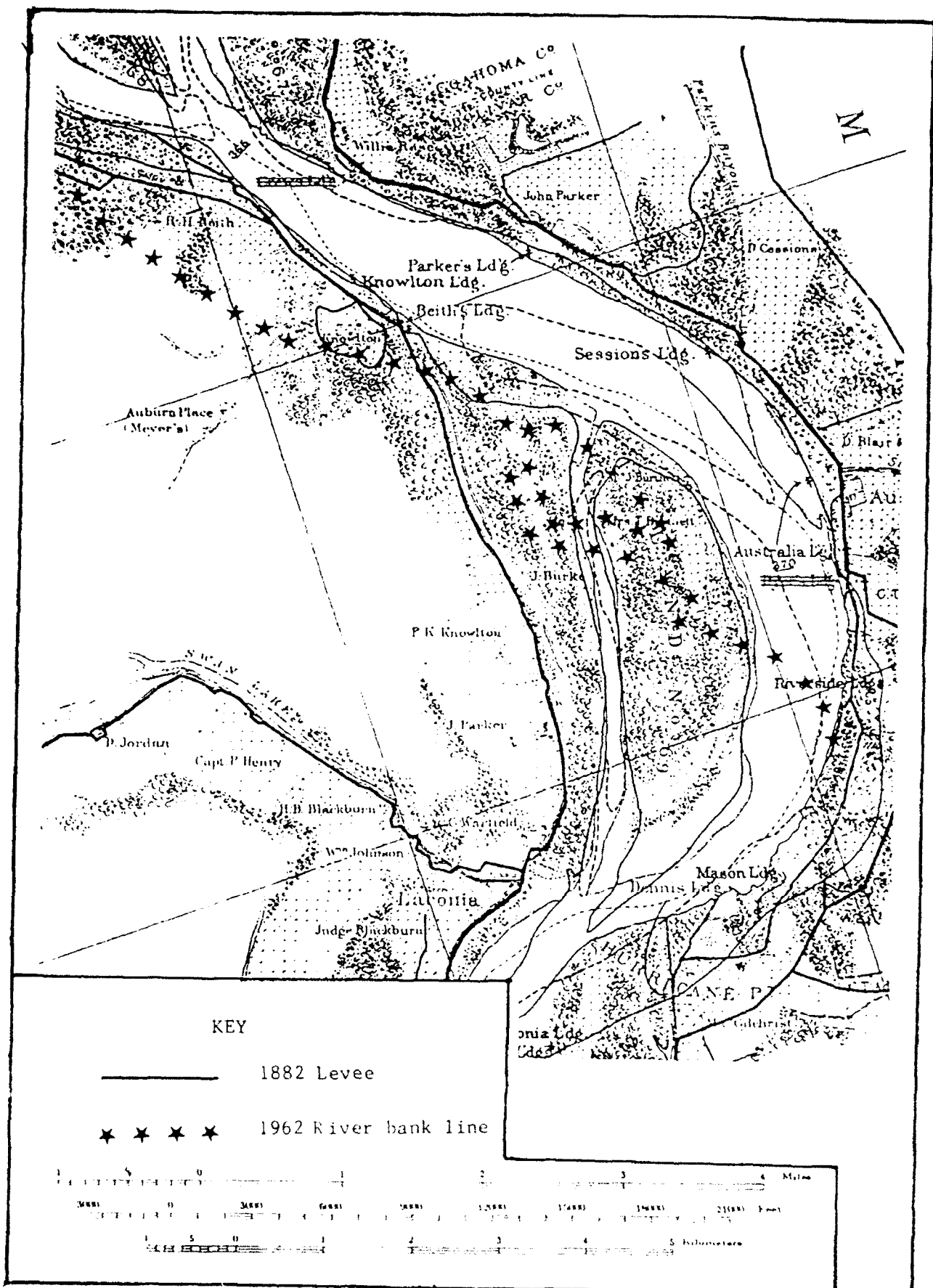


Figure 4.3 Location of Knowlton and Knowlton church and cemetery, 1882
(Base map 1882 Mississippi River Commission Map)

The erosion of land by the river from 1882 and then the floods during the early years of the 20th century destroyed Knowlton and Beith's Landing. The families moved and today the area is uninhabited. Today the study area is agricultural land.

Land is owned by two agribusiness corporations, the Woods-Sanderlin farms who own some 3,000 acres and Brooks Griffin who owns 35,000 acres (Luther Miller 1983:personal communication). Land on the riverside of the levee is mostly in pasture or waste land with a small amount cultivated. Land on the landside of the levee is 98% cultivated and a few low-lying areas are still wooded.

Brooks Griffin, the major landowner of the region, came into the Knowlton area in the 1940's. He bought 160 acres and began farming operations. Today he owns the above mentioned 35,000 acres and a large grain elevator in Mellwood, Arkansas. He is known as a good man to work for but insists that his employees be on call at all times except Sunday. Sundays are a day of rest and the whole Brooks Griffin operation shuts down from 12 a.m. Saturday to 12 a.m. Sunday (Luther Miller 1983:personal communication).

Civil War (1860-1875)

The study area played but a small part in the Civil War and its aftermath. Although Union naval vessels were constantly passing the study area on the river and Confederate forces roamed the land areas, no hostile activities took place in the project area. However, just north of the project area at Island 68 several engagements took place. In 1863 the Confederates used the island to harass the Union boats on the Mississippi. In June of that year the Union forces shelled this Confederate force and the Rebels fled, escaping with their artillery (Bragg 1977:108). In 1864 the Commander of the U.S.S. Tyler attempted to capture some Rebel officers who were reportedly visiting a plantation opposite Island 68. Upon attacking at 2 a.m. in the morning the officer found the Rebels gone and was forced upon presentation of a U.S. Treasury agent's permit by Mrs. Warfield, to protect her shipment of cotton as well as to proceed to her plantation and help with the arrangements for shipping (Bragg 1977:109).

Reconstruction was a period of reorganization in this area with generally little upheaval in the lives of those inhabiting the area. By the late 1870's prosperity was returning to the region.

Riverine Period (A.D. 1780 - A.D. 1930)

The Riverine period is the interval when the use of water routes dominated transportation of people, goods and ideas. The actual transport was conducted first with canoes, bateaux, keelboats and flatboats, and, after 1830, with steamboats of adaptive tonnage and draft. An integral part of this riverine network were the shore support facilities established to service the river net or to tie the land and water net together (Stewart-Abernathy and Watkins 1982:H33).

The Mississippi River has been of extreme importance in the project area. Early settlement of the area came from the river and is evidenced by early landholdings (Figure 4-2). The action and movement of the river has had a

great impact upon the project area. Since 1830 the river has eroded over 805 meters (1/2 mile) of land surface. This erosional pattern has caused massive changes in the settlement pattern of the area having destroyed the communities immediately along the river such as Knowlton and Beith's Landing. Today no habitations are found on the riverside of the present levee. This levee was built between 1936 and 1939 (U.S. Army Corps of Engineers 1936; 1939). A major impetus to the reconstruction of the levee were the floods of 1913, 1916 and particularly 1927. During the floods of these years crevasses occurred at Knowlton causing extensive flooding. The crevasse of 1916 caused a deep hole known as the Knowlton Blue Hole to be formed (U.S. Corps of Engineers 1954). The flood of 1927 caused even more damage. On April 21, 1927 the levee crevassed at Knowlton and the whole levee appeared in danger of giving way. That evening one of the government work boats, the Pelican, was swept into the crevasse and all on board but two were drowned. These two men, Julius Elder and Oscar Clemmons were saved by the heroic actions of Sam Tucker (Clay 1976:85-86). The whole of Mississippi township was covered with water 13 to 30 feet deep (Merritt 1976:12). The crevasse occurred at the town of Knowlton near Knowlton's store and was 805 meters (1/2 mile) wide. A major cause of this break was the fact that the main levee was not up to standard and grade in this area (Merritt 1976:5).

Transportation by boat was important along this stretch of river until the abandonment of the landings after the flood of 1927. The increased competition with railroads and trucks also helped finalize the demise of this form of transportation. Today no landings are in the area but barge traffic is heavy along the river and an average of 10 to 15 tugs with their barges pass the project area each day.

5.0 ARCHIVAL SEARCH AND PERSONAL INTERVIEWS

Methodology

Prior to the beginning of field investigations, the Arkansas Archeological Survey at Fayetteville, Arkansas was contacted in order to ascertain the extent of previous work in the project area and to identify previously recorded archeological sites within the vicinity of the project area.

The National Register of Historic Places and its supplements were examined for listed sites.

Various libraries in Arkansas and Louisiana were visited and their holdings checked for pertinent information. In Arkansas the Arkansas City Library, Arkansas City, Arkansas; the Desha County Library, McGehee, Arkansas; the University of Arkansas Monticello Branch Library, Monticello, Arkansas; the Phillips County Library, Helena, Arkansas; the Dumas City Library, Dumas, Arkansas; and the Historical Preservation Commission Library, Little Rock, Arkansas were visited. In Fayetteville, Arkansas, Mullins Library, University of Arkansas; James Scholtz Memorial Library, Hotz Hall, University of Arkansas; and the Arkansas Archeological Survey Library all in Fayetteville, Arkansas were visited. In Louisiana the Ouachita Parish Public Library and Sandel Library, Northeast Louisiana University both in Monroe, Louisiana were visited. Also Prescott Memorial Library, Louisiana Tech University and the Lincoln Parish Public Library were both visited in Ruston, Louisiana.

State and Federal agencies consulted were the U.S. Army Corps of Engineers Office, Memphis, Tennessee, the Arkansas Archeological Survey, Pine Bluff and Monticello stations.

Dr. Leslie C. Stewart-Abernathy of the Arkansas Archeological Survey, Pine Bluff, Arkansas was visited and consulted as to historic work done in the study area. Mr. John House, also of the Arkansas Archeological Survey, Pine bluff and Monticello stations was visited and consulted about work done in the project area.

The records at the courthouse in Desha County were examined for original land entry information such as plat maps, surveyors notes, old maps and patent books. Departments visited included the County Clerk's Office and Circuit Clerk's Office. Further examination of old county records was done at the Arkansas Historic Preservation Commission Library in Little Rock, Arkansas.

Other individuals interviewed during the course of this study were Mr. Roy Sanderlin and Mr. Philip Gattis, Mosby, Arkansas; Mr. Brooks Griffin, Millwood, Arkansas; Mr. Blackie Moore, Elaine, Arkansas; Mr. Pat Thompson, Crumrod, Arkansas; and Mr. Luther Miller, Mellwood, Arkansas.

Results

Prehistoric

One recorded prehistoric site (3DE19) was believee to be within the project area. This site is not listed on nor has it been considered for

inclusion on the National Register of Historic Places. It was later ascertained by examination of records that this site had been incorrectly located and is not in the project area. Further, there are 13 prehistoric sites recorded within a distance of 16 kilometers (10 miles) of the project area. These sites are listed below in Table 5-1.

TABLE 5-1. Previously recorded prehistoric archeological sites in or within 16 km (10 miles) of the Knowlton project area.

STATE SITE NUMBER	SITE NAME	PHILLIPS, FORD & GRIFFIN NO.	TEMPORAL SPAN	SITE STRUCTURE
3DE18	NA	NA	Late Mississippian	Village, cemetery and mound
3DE19	NA	NA	Mississippian	NA
3DE20	NA	NA	Mississippian	Possible temple mound
3DE21	NA	NA	Mississippian	Flat topped mound
3DE22	NA	NA	NA	Mound
3PH1	Dupree	16-L-6	Mississippian	Large village with large rectangular platform mound and small mounds in plaza arrangement
3PH2	NA	NA	NA	NA
3PH3	Avenue	16-M-1	Mississippian	Scatter
3PH4	NA	NA	NA	Small mound and midden
3PH64	NA	NA	Woodland	Scatter
3PH65	NA	NA	NA	NA
3PH113	NA	NA	Mississippian	Mound
3PH126	NA	NA	NA	NA
3PH186*				Scatter

*May be the same as 3PH3 (Avenue).

Information about a mound site was obtained from Roy Sanderlin of Mosby, Arkansas. Further information about this site and its contents was obtained from Luther Miller of Mellwood, Arkansas. On further investigation it was ascertained that this site had been recorded as 3DE18 but had been recorded in the wrong location.

Historic

Two historic archeological sites (3DE77 and 3DE78) have been recorded in the study area. Neither of these are listed on or have been nominated for the National Register of Historic Places. Five other previously recorded historic archeological sites are located within 16 kilometers (10 miles) of the project area (Table 5-2). None of these sites are listed on or nominated for inclusion on the National Register of Historic Places.

One previously recorded architectural site (6-C-1) was found through investigation of the literature (McNerney and White 1982:87-88). This site

is not listed on or nominated for inclusion on the National Register of Historic Places.

TABLE 5-2. Previously recorded historic archeological sites within 16 km (10 miles) of the Knowlton project area.

HISTORIC SITE NO.	TEMPORAL PERIOD	SITE STRUCTURE
3DE77	Recent	Non-extant structure
3DE78	Recent	Non-extant structure
3DE79	Recent	Non-extant structure
3DE80	Recent	Non-extant structure
3DE81	1820-1894	Cemetery
3DE82	1855-1920	Non-extant structure
3DE83	1830-1920	Non-extant structure

Copies of original General Land Office plats were obtained at the Desha County Courthouse. No Spanish or French land grants were shown in the area. These maps did indicate that the main channel of the Mississippi River ran approximately 610 meters (2000 feet) east of its present channel in 1830. Surveyors notes located in the Desha County Courthouse indicated that settlement in the project area was established in 1830. The same source indicated that vegetation was the same as that to be found in undisturbed areas today.

The Mississippi River Commission Maps (1882) were examined. These indicated the owners, land use and structures found in the area at the time. U.S. Army Corps of Engineers topographic maps (1930, 1936, 1939, 1954 and 1962) for the area were examined. These indicated settlement patterns for the study area.

Library sources disclosed information about the specific project area in the late 1800's and early 1900's. Other library sources divulged information on the general area of Desha County and Arkansas.

Local informants disclosed information about happenings in the specific project area and an abandoned historical cemetery in this project area.

Further discussion of the results of the archival and personal interview search will be found in the Historic Activity section of the Cultural Sequence chapter; the Survey, Testing and Analysis chapter; Appendix B; and Appendix C.

6.0 HUMAN SETTLEMENT AND HABITAT EXPLOITATION

Based upon the reconstruction of the alluvial history of the project area presented earlier in this report, it is expected that land surfaces (or buried land surfaces) will not predate approximately A.D. 300. It is possible that there are unknown sites that predate this period, which would imply an older time period for the land surfaces. Throughout the alluvial history of the study area (at least since 12,000 B.P.) the region is believed to have been a riverine environment, either braided or meandering in nature.

Smith (1978:480-483) delineated a number of geomorphological attributes associated with meander belt zones of major rivers. The dynamic regime of a river meander system results in a complex pattern of surface morphology. Aggrading rivers develop asymmetrical natural levees that slope back gradually into backswamp deposits. Lateral meandering of the river results in the reworking of these natural levee deposits, producing ridge and swale topography and the formation of cut-off or oxbow lakes. As a result, complex curvilinear bands of differing soil characteristics are developed.

These complex attributes of a riverine environment are associated with a number of environmental attributes. First, these meander zones represent a naturally subsidized, solar powered ecosystem (c.f. Odum 1975). In addition, the meander belt zone receives a power subsidy in the form of a constant, water-born flow of nutrients through the zone. Second, the differential characteristics associated with the curvilinear bands of soil result in plant communities of distinctive vegetative types in close association to each other. The result is long linear interfaces between distinct plant communities that support a variety of species of animals at relatively high population densities. Third, these meander belt zones are environmentally circumscribed. The energy subsidized, curvilinear bands of soils capable of supporting a high biomass are isolated from upland areas by parallel tracts of low backswamp areas (with the exception of areas where the river is adjacent to the valley escarpments).

Specific human settlement and habitat exploitation patterns through time would have been dependent, to a large extent, on the particular settlement and subsistence strategies employed by a culture during any one time period. The discussion of changes in settlement habitat and exploitation through time will be limited to those periods for which there is evidence of extant stable land surfaces. Therefore, the discussion will begin with the Middle Woodland (Marksville) Period (100 B.C. - A.D. 300).

Since the beginning of the Middle Woodland Period, the subsistence strategies of prehistoric cultures within the southern portion of the Mississippi Alluvial Valley have undergone a slow transformation from an emphasis on hunting and gathering of natural resources supplemented by limited horticulture, to an emphasis on intensive agriculture supplemented by hunting and gathering. To a large extent, the settlement strategy of the different cultures were dependent upon the subsistence strategy. Thus, hunting and gathering activities would have required a high degree of mobility to efficiently exploit seasonally available resources located in spatially discreet areas. This high degree of mobility would probably have taken the form of a

seasonal round. Although no research on this type of subsistence and settlement system has been conducted for the Middle Woodland period in this region, it is possible to hypothesize a general seasonal round based upon the seasonal availability of different faunal and floral species of the region. Smith (1975:122) suggests that exploitation of animal populations in the Mississippi Alluvial Valley can be divided into two basic seasons: 1) a summer season during which various species of fish were the most intensively exploited, with aquatic species of turtles and perhaps rabbits being of secondary importance and 2) a winter season of exploitation during which a wide variety of fauna, including deer, bear, squirrel, opossum, beaver, wild turkey, raccoon, rabbits and waterfowl were exploited. In addition, nuts, seeds and berries, as well as limited horticulture of native and tropical cultigens, would have been gathered in the spring, summer and fall.

Archeological evidence suggests that to encompass the variability associated with distinct resources, cultures were employing a settlement system in which a small number of households would gather together in a base camp during the fall to provide group participation for efficient hunting and gathering of natural resources. This group would probably remain together through the winter in a semi-permanent base camp.

In the spring, this group of households would probably fragment with each household moving to a new location near riverine resources to exploit spawning fish populations, as well as floral resources. During the summer, these individual households would have engaged in limited horticulture, supplemented by hunting and gathering activities. The result would be a series of semi-permanent bases consisting of single households. Associated with both the winter and summer base camps would be a wide range of special activity sites for the purpose of resource extraction, resource preparation or tool kit maintenance.

The shift to a greater emphasis on agriculture supplemented by hunting and gathering would have resulted in a similar subsistence and settlement pattern, although there would have been some differences. Essentially, the shift to intensive agriculture would have allowed greater population densities. Thus, it is expected that the winter base camps would have consisted of relatively large villages consisting of numerous households. During the summer, these villages would have fragmented into single households to allow efficient exploitation of easily tillable soils. However, during the Late Mississippian period (A.D. 1350-A.D. 1500), increased warfare may have required that people remain in fortified villages throughout the year, with occasional forages to manage centrally located fields, or for limited hunting or gathering.

7.0. SURVEY, TESTING AND RESULTS

Methodology

The areas surveyed were right-of-way corridors associated with proposed berm and borrow activities (Figure 1-2). All areas were traversed so that 100% of the visible ground surface was examined. Road grades, ditch bank walls and rodent holes within the rights-of-way were examined for evidence of subsurface cultural remains. As proposed, areas that were flooded were not surveyed. The interior portions of borrow pits were examined for surface evidence of recent cultural activity and exposed profiles of recent borrow pits were inspected for the presence of subsurface cultural material and to determine natural stratigraphy.

Since survey and testing of sites are qualitatively different, in the types of activities conducted and the equipment required, two aspects of the project were split into two distinct phases for purposes of efficiency: 1) a survey phase and 2) a limited testing phase. During the survey phase three archeologists surveyed transects, spaced approximately 30 meters apart or less, by walking a zig-zag pattern such that 100% of the visible ground surface was examined. In general, the degree and intensity of subsurface shovel testing was dictated by surface visibility and degree of disturbance by levee borrowing and logging using heavy equipment. In areas of low surface visibility that had not been disturbed by land leveling activities, shovel tests were dug every 30 meters (98.4 feet). Further, these shovel tests were screened through 1/4" hardware cloth. Soil profiles of these shovel tests were recorded. In areas disturbed by borrowing, land leveling and logging using heavy equipment, no shovel tests were dug, although areas were walked and cutbanks were examined.

The existing levees and berms were not surveyed.

When a site was found, it was recorded on the project aerial photo blue-lines and flagged with surveyor's flagging tape to allow easy identification during the testing phase. Standing structures were described and photographed.

General Testing Procedures

After the survey was completed, each site was revisited for the purpose of testing to obtain additional data. The first step of the testing procedures consisted of establishing the site boundaries, accurately mapping the site boundaries and establishing permanent datums, making controlled surface collections, excavating at least one 1 x 1 meter test unit and, when needed, digging a series of shovel tests at the perimeter of the site to further define site boundaries.

To facilitate mapping of the site boundaries, small poles with flagging tape attached were stuck in the ground at the edges of the surface expressions of cultural material. This served two purposes: 1) it allowed easy mapping of the site and 2) it allowed easy visualization of the form of the site which facilitated selection of locations for collection units, the 1 x 1 meter test units and, when necessary, further shovel testing to define site boundaries.

Mapping of the sites was conducted with the use of a transit and stadia rod. A temporary datum was established on each site and then tied into permanent datums. The permanent datums consisted of large trees (a nail was driven into each datum tree), gate posts on levee roads, navigation towers on the Mississippi River and permanent utility company warning signs. Two or more permanent datums were established for each site. After the temporary datum was established, the perimeter of each site was mapped in, as well as relevant cultural features such as borrow pits, roads, toe of the levee and fences. The southeast corner of each collection unit and 1 x 1 meter test units, and any further shovel tests were also mapped in.

The location of controlled surface collection units were based upon the character of each site. The major factor was a need for representiveness. Thus, in sites with a fairly homogenous distribution of artifacts, only one collection unit was necessary. However, if there were concentrations of different types of material, then more than one collection unit was collected to reflect this diversity in material. In one instance, no surface collection was made as one of these sites was an occupied architectural site, the second an historic cemetery and the third an active modern dump.

In a similar manner, the location of each 1 x 1 meter test unit was based upon the overall character of the site. Generally, 1 x 1 meter test units were placed near the center of sites, in areas that exhibited high concentrations of surface material. It was assumed that high densities of surface material should reflect a high density of subsurface material, if such deposits were present. All material excavated from the 1 x 1 meter test units was screened through 1/4" hardware cloth. Where possible, these test units were excavated by natural stratigraphy. Plow zones were excavated as a single unit. In areas exhibiting soil stratigraphy, each soil stratum was excavated in 10 centimeter levels. In areas with no soil stratigraphy, units were excavated in arbitrary 10 centimeter levels. At each site, the test units were extended to a depth of at least 20 centimeters below artifact bearing soils. In addition, one corner of each test unit was extended at least 40 centimeters below artifact bearing soils. Representative profiles of soils and stratigraphy were made for each test unit. After these activities, the test unit was backfilled and compacted to allow reasonable pedestrian safety.

If the excavation of the 1 x 1 meter test unit indicated there were subsurface cultural deposits extending below the plowzone, then a series of shovel tests (approximately 30 x 30 centimeters wide and 50 centimeter deep) were dug and the fill screened through 1/4" hardware cloth to determine if there were subsurface deposits extending beyond the site boundaries identified by surface inspection.

These shovel tests were excavated along major axes of the site. The shovel tests were begun at the site boundary, identified by surface inspection, and then extended outward from the site. Shovel tests were dug until three consecutive shovel tests indicated no evidence of subsurface cultural deposits. In every case completed, there were no subsurface cultural deposits beyond the site boundaries identified by surface examination. However, testing in one case was halted due to the appearance of a crop duster who sprayed the site area with chemical defoliant necessitating abandonment of the site. If the 1 x 1 meter test units indicated there were no cultural deposits extending below the plow zone, then the site boundaries identified by surface inspection were accepted.

Specific Survey Methodology

For the purposes of survey and report presentation, the project area has been divided into riverside and landside areas (Figure 7-1). In the following sections specific survey methodology for these areas are reported.

Riverside Survey: Station 49/0+00 to Station 52/49+05

The riverside portion of the survey extends for 6,254.80 meters (20,521 feet) between the existing levee and the Mississippi River. The width of the area ranges from 364.8 meters (870 feet) to 569.6 meters (1,870 feet) with an average of 457.2 meters (1,500 feet) excluding the present levee and levee berm. Surfaces of the entire riverside segment are 98% covered by borrow pits and artificial levees. The remaining two percent are believed to be natural levee deposits and are confined to the river's edge. Of these deposits 60 percent have been heavily disturbed by heavy equipment activity. The borrow pits are 60 percent filled with water or mud. The remaining 40 percent are cultivated or in pasture and have had additional land leveling activities carried out along their margins.

The riverside segment was surveyed by three archeologists moving south to north. Each archeologist moved in a zig-zag pattern through the area.

Subarea A. As the area between Station 51/13+50 and Station 52/49+05 consisted of deep, waterfilled borrow pits, shovel tests were not dug and examination of the area consisted of confirming the existence of multiple borrow pits and excavating representative profiles on borrow pit margins.

Vegetation in this portion of the survey area ranged from 0 to 100% depending upon the amount of vegetation. Vegetation varied from none in the bottoms of some pits and disturbed areas to heavy forest and undergrowth in others. No cultural materials were found in this area.

Subarea B. From Station 50/33+88 to Station 51/25+00 a narrow segment of natural levee still exists. This segment is approximately 150 meters (500 feet) wide and 1,067 meters (3,500 feet) long. It has been thoroughly disturbed in the past by logging activities and the use of heavy equipment. This area, due to the extreme disturbance and displacement of soils was not shovel tested. Three archeologists surveyed this area. Each moved in a meandering pattern covering a transect of 30 meters (100 feet) in width until the area was completely surveyed. It is in this area that NLU-83-207, an historic cemetery, is located. This cemetery was not found during the survey but located after an extensive search by an archeologist and local guide.

Vegetation in the area consists of woods with moderate to heavy undergrowth. Ground visibility is 0-100% averaging about 40%.

Subarea C. From Station 49/0+00 to Station 50/33+88 the riverside area is borrow pits that are either cultivated or in pasture. This area was surveyed by three archeologists moving across these borrow pits in a meandering pattern covering transects of 30 meters (100 feet) until the area was covered. Shovel testing was not done in these borrow pits. Ground surface visibility ranged from 100% on plowed ground to 10% on heavily vegetated

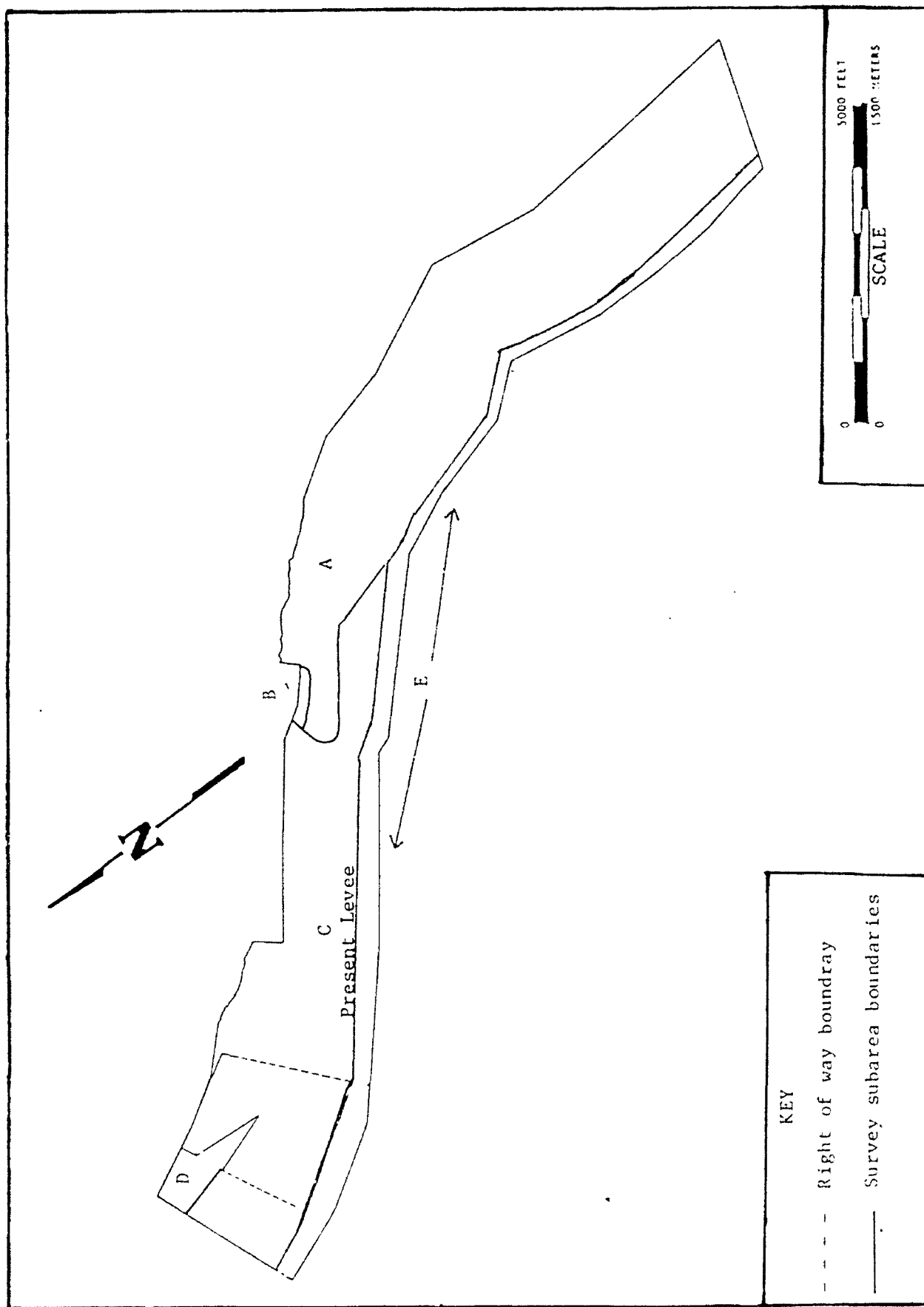


Figure 7.1 Location of subareas within the project area

pasture. Vegetation was either soybeans .76 to .90 meters (2.5 to 3 feet) tall or short grass pasture. Cultural material found in this area included an isolated prehistoric find (NLU-83-203) and a modern active dump (NLU-83-209).

Subarea D. Along the river from Station 49/0+00 to Station 49/8+00 extending 183 meters (600 feet) from the river's edge is the remnants of another natural levee. This area appeared to be undisturbed. It was surveyed by three archeologists. Two archeologists moved in meandering patterns covering transects of 30 meters (100 feet) in width. Shovel tests, 30 x 30 x 50 centimeters, were dug at 30 meter intervals. All shovel tests were dug at 30 meter intervals. All shovel tests were screened with 1/4 inch wire mesh. The third archeologist moved in a meandering pattern from shovel test to shovel test, recorded soil profiles and filled in the test holes. Ground surface visibility was 10 to 50% in this area. Vegetation was short grass pasture. No cultural remains were found in this area.

Landside: Station 49/0+00 to Station 52/49+05

The landside portion of the survey extends from 6,254.80 meters (20,521 feet) along the landside of the existing levee. The width of the survey area, excluding levee and levee berm, is 46 to 60 meters (150 x 200 feet).

Seventy-two percent of the landside surface is under cultivation. The remaining 28 percent is wooded.

Survey of the landside was done by teams of two archeologists moving from south to north. Each moved in a meandering pattern covering a transect of 30 meters (100 feet). Shovel tests 30 x 30 x 50 centimeters were dug at 30 meter intervals. Matrix from these tests were screened through 1/4 inch wire mesh screen.

Ground surface visibility was from 10-50% in the wooded areas to 50 to 100% in the cultivated segments. Vegetation in the wooded areas consisted of hardwood trees and underbrush. Cultivated areas were either fallow, or planted in soybeans or cotton.

Three cultural resources were located in this area. One was an architectural site (NLU-83-204), one prehistoric archeological site (NLU-83-205) and one an historic archeological site (NLU-83-206).

Sites Recorded

A total of six cultural resources were recorded. Of these, two are archeological sites, one an isolated prehistoric find, one an architectural site, one an historic cemetery and one a modern dump.

For all sites recorded physiographic data including geomorphology, soil unit/group complex, topography, elevation and water resource availability is provided in Table 7-1. In the following section each site is described and discussed. Data from Appendix B is utilized.

TABLE 7-1. Physiographic Setting for Cultural Properties Recorded Along Portions of the Knowlton Levee Project, Knowlton, Arkansas

SITE NUMBER NLU-83-	GEOMOR- PHOLOGY	SOIL UNIT/ GROUP COMPLEX*	TOPOGRAPHIC FEATURE	ELEVATION (FEET AMSL)	WATER RESOURCE AVAILABILITY NAME/DISTANCE (METERS)/ DIRECTION
203	Alluvial	Borrow pit	Borrow pit bank	160	Mississippi River present channel 75 meters east
204	Alluvial	Bruno loamy sand	Floodplain	160	Mississippi River present channel 670 meters east
205 also 3DE18	Alluvial	Commerce silt loam	Floodplain positive relief	155	Small stream of edge of site west
206	Alluvial	Bruno loamy sand	Floodplain positive relief	160	Mississippi River present channel 670 meters east
207	Alluvial	Sharkey- Commerce- Coushatta association	Floodplain positive relief	160	Mississippi River 1882 channel 670 meters east
209	Alluvial	Borrow pit	Borrow pit	155	Mississippi River present channel 396 meters east

Site NLU-83-203

This is the location of an isolated find of two prehistoric sherds and is located in a plowed field that has been utilized as a borrow pit. The area has also been subject to deforestation and land leveling. In 1982 land leveling was done on this site immediately after work was done in the vicinity of 3DE18 (NLU-83-205) (Phillip Gattis 1983:personal communication). The latter site is just east of the levee from the presently discussed location

and it would appear that the two sherds found here were imported on the tires or treads of the machinery that worked at both sites.

Site NLU-83-204

This architectural site lies at the base of present levee on the land side on the level alluvial floodplain. The site is a complex of farm buildings covering an approximate area of 107 x 76 meters (350 x 250 feet). No buildings are shown at this location on the Mississippi River Commission Maps of 1882 although the land was cleared and in cotton production. It was owned by P. K. Knowlton at this time.

The earliest available topographic quadrangle (U.S. Army Corps of Engineers 15' Mellwood 1930) indicates buildings at this site as do the subsequent 1936, 1939, 1954 and 1962 quadrangles. The complex is presently owned by Brooks Griffin of Mellwood, Arkansas, who rents it to tenants. McNerney and White (1982:87-88) documented this complex in their survey of this area. Based on type and archival information (U.S. Army Corps of Engineers, Mellwood 15' topographic quadrangles 1930, 1936, 1939, 1954, 1962) this architectural site would appear to have been built sometime in the 1920's.

Site 3DE18 (NLU-83-205)

This site, originally reported by Jim Wood in 1969, occupies a slight rise within alluvial floodplain deposits and covers approximately 65,000² meters (200 x 325 meters; 600 x 1,066 feet). The site consists of a moderate density scatter of prehistoric and historic artifacts. A low prehistoric mound is also evident. Subsurface material extends at least 1.4 meters (4.5 feet) below the ground surface in some portions of the site (Luther Miller 1983: personal communication). During the investigations subsurface cultural material was found at a depth of 30 centimeters below the surface (test unit 2). Because of interrupted testing due to defoliant spraying, this test unit was not completed and the actual depth of cultural materials at that location on the site was not determined. At other locations material was found only in the upper 20 centimeters. The site has been cultivated and the southern portion levelled. However, the integrity of the site still remains as it appears that there are extensive undisturbed subsurface deposits (Luther Miller 1983:personal communication).

Prehistoric artifacts recovered included shell tempered pottery, bone, including human, chipped and ground stone and daub. Analysis of these materials dates this site to the Late Mississippian period (John House 1983: personal communication). Present are Owens and Parkin Punctated type sherds as well as Wallace Incised. These have been dated by Phillips (1970) as Late Mississippian. Although chipped stone flakes were collected and chipped tools such as celts (Appendix C) have been recovered from this site, no points have ever been reported from it (Luther Miller 1983:personal communication). This may indicate a very heavy dependence upon agricultural activities for subsistence or the use of bone and perhaps cane and wood for points, rather than stone.

From the artifactual evidence it appears that the prehistoric component represents the remains of a Late Mississippian mound, village and cemetery. On the basis of the artifacts (ceramics) recovered it would appear that this

heavy dependence upon agricultural activities for subsistence or the use of bone and perhaps cane and wood for points, rather than stone.

From the artifactual evidence it appears that the prehistoric component represents the remains of a Late Mississippian mound, village and cemetery. On the basis of the artifacts (ceramics) recovered it would appear that this site is late, perhaps even of the contact period (A.D. 1450 - A.D. 1660). Luther Miller (1983:personal communication) reports that he hit something that felt like glass with his probe while collecting from the site. If this is the case it may indeed be evidence of contact between the Mississippian peoples inhabiting this site and Europeans. The site is reported to have rectangular stains that are visible when the area lies fallow. These may be the remnants of middens or even structures. Burials have been located not only in the plow zone where they have been destroyed by agricultural activity, but also at least 1.4 meters (4.5 feet) deep. Luther Miller (1983:personal communication) reports that he has dug burials as deep as 1.4 meters (4.5 feet). For the first few years after the site was cleared and plowing begun it was common for burials to be brought up. The farm hands would then decorate their tractors with the skulls. Today only broken fragments of these former burials are to be seen. The southern portion of the site belonging to Brooks Griffin was levelled in 1982. However, subsurface material is still extant and Miller found a small jar about 10 centimeters below the surface in this area (Figure C.4 1983:personal communication).

The historic component at this site is an non-extant house site and a reported cemetery. Based on the appearance of a structure at this location on the 1930 U.S. Army Corps of Engineers 15' Mellwood quadrangle but not one on the 1882 Mississippi River Commission Maps, it would appear that the historic component dates to at least 1930 but not before 1882. This is also confirmed by the finding of purple glass on the site. Purple glass is a time marker having been manufactured between 1880 and 1915. The small quantity of this material found and the other types of historic cultural materials would argue for a date closer to 1930 than 1882. Materials found include stoneware, annular ware, wire fence staples, rubber hose and glass of various colors. All of these items except purple glass can still be obtained. Informants recall that there was a house at this site and that it was destroyed in the 1970's (Phillip Gattis 1983:personal communication).

It is also reported that the mound portion of the site was used as an historic cemetery. Reportedly both blacks and whites are buried here (Philip Gattis; Luther Miller 1983:personal communication). If this is the case, intrusive historic materials may be found at depth. Reportedly some of the burials plowed up wore fabric type clothing. These would certainly be from the historic period (Luther Miller 1983:personal communication).

This site is interpreted primarily as a Late Mississippian mound, village and cemetery. Secondly there is an historic component consisting of a non-extant house site and reportedly an historic cemetery. These probably date from the early 20th century based on the artifactual and archival material available.

Site NLU-83-206

This site occupies level alluvial floodplain deposits along the base of the present levee. The site size is 50 x 30 meters (164 x 100 feet) and is bounded by roads on the north, east and west.

The site is expressed by a surface low density scatter. Artifacts recovered include glass, whiteware, rubber and plastic. Diagnostic artifacts appear, on the whole, to post-date World War II. This date would be corroborated by the first appearance of structures at this site on the 1954 U.S. Army topographic quadrangle for the area. The earliest map depicting a structure at this location is the 1954 U.S. Army Corps of Engineers 15' Mellwood topographic quadrangle. No structure is depicted on the site area in any of the earlier versions (1930, 1936 and 1939) of this quadrangle.

The entire site is believed to have been destroyed by razing of the structures and subsequent intensive agricultural activities sometime after 1962.

Site NLU-83-207

This site, an historic cemetery, is located approximately 38 meters (125 feet) landside of the topriver bank of the Mississippi River. Presently most of the area has been heavily disturbed by borrowing and bulldozing activities.

Remains of this cemetery were restricted to one broken, marble tombstone and a twisted section of wrought iron fence. The area was heavily disturbed and original site size could not be determined. Measurements taken from the 1882 Mississippi River Commission Maps indicate that the cemetery was 91.44 meters east-west x 152.4 meters north-south (300 x 500 feet). Of this, only the western edge of a strip approximately 23 x 30 meters (75 to 100 feet) remains. Most of this has been destroyed by revetment work and a local road. The site has been completely eroded by the river and the grave located is probably on the very western edge of the cemetery. Progressive erosion of the river bank can be seen by comparing the 1882 Mississippi River Commission Map to the 1930, 1936, 1939, 1954 and 1962 U.S. Army Corps of Engineers 15' Mellwood, Arkansas-Mississippi quadrangle.

From archival evidence this site has been interpreted to represent the remains of the Knowlton Community Cemetery.

Site NLU-83-209

This site is an active trash dump. The dump is within a borrow pit which was dug during the construction of the modern levee which was built between 1936 and 1939 (U.S. Army Corps of Engineers 15' Mellwood quadrangles, 1936 and 1939). The site area is approximately 100 x 75 meters (328 x 246 feet).

The contents of the dump include automobiles, pick-up trucks, household appliances and other refuse. Second class mail found in some of the piles are post-marked September 1983 and were addressed to individuals living in the local area. The oldest datable object noted was an automobile built in the mid-1960's.

8.0 SIGNIFICANCE

In the following paragraphs each of the six cultural resources identified during the survey is considered for significance (potential eligibility for inclusion on the National Register of Historic Places).

Potentially Significant Sites

NLU-83-205. This prehistoric/historic site, consisting of a prehistoric mound, village and cemetery and historic house site and cemetery, is believed to be potentially eligible for inclusion on the National Register of Historic Places.

The prehistoric component of this site has been interpreted as representing Late Mississippian period (John House 1983:personal communication). The historic component has been interpreted as an intrusive cemetery and house site. This component has been placed as dating to between 1882 and 1930.

The prehistoric component has been disturbed to some extent by the intrusive historic cemetery. It should be noted that this is true of many prehistoric mounds within the floodplains of major rivers as these were above the water table and provided excellent places for cemeteries. Further, this component has been disturbed by cultivation and amateur excavation. The latter two disturbances are apparently minimal. Cultivation, although it has destroyed the upper 17 centimeters of material, has not affected the deeper lying deposits. According to Luther Miller, a local collector, the site is at least 1.37 meters (4.5 feet) deep. Destruction by amateur excavation from the site is limited and the site appears virtually undisturbed by this activity.

The criteria of significance (36 CFR 60.6) were applied to this site with the following results:

1) Given the fact that there may be in situ material, if this is a Late Mississippian mound, village and cemetery, it is expected that this site could provide valuable information concerning: a) the mortuary ritual of the prehistoric society that built and used the mounds, b) the level of social organization as indicated by mortuary analysis, c) the economic sphere of influence as indicated by exotic grave goods, d) possible subsistence strategies and their effectiveness as indicated by bio-physical analyses of skeletal material, e) house and settlement patterns in Late Mississippian villages and f) possible early Indian-European contact in the Lower White River Basin.

For these reasons, the prehistoric/historic site, NLU-83-205, is considered potentially eligible for inclusion on the National Register of Historic Places.

Nonsignificant Sites

Of the five cultural resources not believed significant, one is an isolated prehistoric find, one an architectural site, one an historic scatter and the last an historic cemetery.

NLU-83-203. This prehistoric isolated find does not meet the criteria for inclusion on the National Register of Historic Places. It has been determined that the artifacts found were introduced by modern agricultural equipment. The site is not associated with events of historical or archeological importance and as there is no in situ material, this site will not yield information important in interpreting the history of the area.

NLU-83-204. This architectural site does not meet the criteria for inclusion on the National Register of Historic Places. It does not exhibit any architectural or historical importance. Therefore, it is not believed eligible for inclusion on the National Register of Historic Places.

NLU-83-206. This historic site does not meet the criteria for inclusion on the National Register of Historic Places. This site was not associated with events that have made a significant contribution to the broad patterns of our history nor is it associated with the lives of persons significant in our past. Further, the lack of in situ material makes it unlikely that this site would yield information important in interpreting the history of the area.

NLU-83-207. This site does not meet the criteria for inclusion on the National Register of Historic Places as historic cemeteries are in most cases specifically excluded. Further, it is not associated with events that have made a significant contribution to the broad patterns of our history nor is it associated with the lives of persons significant in our past.

NLU-83-209. This site is not associated with events that have made a significant contribution to the broad patterns of our history nor is it associated with the lives of persons significant in our past. Further, the lack of material, other than recent historic trash, makes it unlikely that this site would yield information important in interpreting the history of the area. Therefore, this site does not meet the criteria for inclusion on the National Register of Historic Places.

9.0 IMPACTS

None of six cultural resources located will be impacted by the presently proposed work (Table 9-1).

TABLE 9-1. Impacts on Cultural Resources in the Project Area

SITE NUMBER	LOCATION STATION	IMPACT ON SITE
NLU-83-203	Riverside	This site will not be impacted by the presently proposed work
NLU-83-204	Landside	This site will not be impacted by the presently proposed work
NLU-83-205	Landside	This site will not be impacted by the presently proposed work
NLU-83-206	Landside	This site will not be impacted by the presently proposed work
NLU-83-207	Riverside	This site will not be impacted by the presently proposed work
NLU-83-209	Riverside	This site will not be impacted by the presently proposed work

10. RECOMMENDATIONS

3DE18 (NLU-83-205)

This site, a Late Mississippian mound, village and cemetery which is believed potentially eligible for inclusion on the National Register of Historic Places, will not be impacted under this contract. No further work is presently needed. If, however, future additional plans will result in impact to the site, additional testing and mitigation should be done.

NLU-83-207

This site, an historic cemetery which is not eligible for the National Register of Historic Places, will not be impacted under this contract. If future plans place it in a zone of impact care should be taken to make sure it is not impacted.

Other Cultural Properties

The other four sites do not meet the criteria for inclusion on the National Register of Historic Places. Therefore, no additional archeological or architectural research is recommended at these locations.

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APPENDIX A
SCOPE OF WORK

SECTION C - DESCRIPTION/SPECIFICATIONS (SCOPE OF WORK)

C-1. GENERAL.

C-1.1. The Contractor shall conduct a background, archival and literature search and intensive survey investigation of select Mississippi River levee berms in Crittenden and Desha Counties, Arkansas, and Mississippi, Scott, Cape Girardeau, and Pemiscot Counties, Missouri. These tasks are in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environment Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment," 13 May 1971 (36 F.R. 3921); Preservation of Historic and Archaeological Data, 1974 (P.L. 93-291), as amended; and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

C-1.2. Personnel Standards.

a. The Contractor shall utilize a systematic, interdisciplinary approach to conduct the study. Specialized knowledge and skills will be used during the course of the study to include expertise in archeology, history, architecture, geology and other disciplines as required to produce acceptable reports. Techniques and methodologies used for the study shall be representative of the state of current professional knowledge and development.

b. The following minimal experiential and academic standards shall apply to personnel involved in cultural resources investigations described in this Scope of Work:

(1). Archeological Project Directors or Principal Investigator(s) (PI). Individuals in charge of an archeological project or research investigation contract, in addition to meeting the appropriate standards for archeologist, must have a publication record that demonstrates extensive experience in successful field project formulation, execution and technical monograph reporting. The Contracting Officer may also require suitable professional references to obtain estimates regarding the adequacy of prior work.

(2). Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study with concentration in anthropology and specialization in archeology and at least two summer field schools or their equivalent under the supervision of archeologists of recognized competence. A Master's thesis or its equivalent in research and publication is highly recommended, as is the M.A. degree.

(3). Other Professional Personnel. All non-archeological personnel utilized for their special knowledge and expertise must have a B.A. or B.S. degree from an accredited college or university, followed by a minimum of one year of successful graduate study with concentration in appropriate study.

(4). Other Supervisory Personnel. Persons in any archeological supervisory position must hold a B.A., B.S. or M. A. degree with a concentration in archeology and a minimum of 2 years of field and laboratory experience.

(5). Crew Members and Lab Workers. All crew members and lab workers must have prior experience compatible with the tasks to be performed under this contract. An academic background in archeology/anthropology is highly recommended.

c. All operations shall be conducted under the supervision of qualified professionals in the discipline appropriate to the data that is to be discovered, described or analyzed. Vitae of personnel involved in project activities may be required by the Contracting Officer at anytime during the period of service of this contract.

C-1.3. The Contractor shall designate in writing the name of the Principal Investigator. Participation time of the Principal Investigator shall average a minimum of 50 hours per month during the period of service of this contract. In the event of controversy or court challenge, the Principal Investigator shall be available to testify with respect to report findings. The additional services and expenses would be at Government expense, per paragraph 1.08 below.

C-1.4. The Contractor shall keep standard field records which may be reviewed by the Contracting Officer. These records shall include field notes, appropriate state site survey forms and any other cultural resource forms and/or records, field maps and photographs necessary to successfully implement requirements of this Scope of Work.

C-1.5. To conduct the field investigation, the Contractor will obtain all necessary permits, licenses, and approvals from all local, state and Federal authorities. Should it become necessary in the performance of the work and services of the Contractor to secure the right of ingress and egress to perform any of the work required herein on properties not owned or controlled by the Government, the Contractor shall secure the consent of the owner, his representative, or agent, prior to effecting entry on such property.

C-1.6. Innovative approaches to data location, collection, description and analysis, consistent with other provisions of this contract and the cultural resources requirements of the Government, are encouraged.

C-1.7. No mechanical power equipment shall be utilized in any cultural resource activity without specific written permission of the Contracting Officer.

C-1.8. The Contractor shall furnish expert personnel to attend conferences and furnish testimony in any judicial proceedings involving the archeological and historical study, evaluation, analysis and report. When required, arrangements for these services and payment therefor will be made by representatives of either the Corps of Engineers or the Department of Justice.

C-1.9. The Contractor, prior to the acceptance of the final report, shall not release any sketch, photograph, report or other material of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer.

C-1.10. The extent and character of the work to be accomplished by the Contractor shall be subject to the general supervision, direction, control and approval of the Contracting Officer. The Contracting Officer may have a representative of the Government present during any or all phases of the described cultural resource project.

C-2. STUDY AREA.

C-2.1. Henrico (R-606). Within an imaginary plane figure beginning at station 57/0+00 and proceeding to station 61/6+07 bounded by 152.4m (500 ft) landside of the levee (as measured perpendicular to the centerline of the levee) and 457.2m (1,500 ft) or top bank riverside of the levee. Thence from station 61/6+07 to station 64/48+00 bounded by 152.4m (500 ft) landside of the levee and 457.2m (1,500 ft) riverside of the levee. This area is located in Desha County, Arkansas, and is shown on the Mellwood, Arkansas-Mississippi and Henrico, Arkansas, 15 minute quadrangle maps.

C-2.2. Knowlton (R-618). Within an imaginary plane figure beginning at station 49/0+00 and proceeding to station 50/0+00 bounded by 152.4m (500 ft) landside of the levee (as measured perpendicular to the levee centerline) and 609.6m (2,000 ft) or top bank riverside of the levee. Thence from station 50/0+00 to station 51/0+00 bounded by 152.4m (500 ft) landside of the levee and 304.8m (1,000 ft) riverside of the levee. Thence from station 51/0+00 to station 52/49+05 bounded by 152.4m (500 ft) landside of the levee and 457.2m (1,500 ft) or top bank riverside of the levee. This area is located in Desha County, Arkansas, and is shown on the Mellwood, Arkansas-Mississippi, 15 minute quadrangle map.

C-2.3. Porter Lake (R-703). Within an imaginary plane figure beginning at station 180/0+00 and proceeding to station 181/2+50 bounded by 0m (0 ft) landside of the levee (as measured perpendicular to the centerline of the levee) and 91.5m (300 ft) or top bank river side of the levee. This area is located in Crittenden County, Arkansas, and is shown on the Horseshoe Lake, Arkansas-Mississippi-Tennessee, 15 minute quadrangle map.

C-2.4. Lambethville (R-752). Within an imaginary plane figure beginning at station 125/39+00 and proceeding to station 129/10+00 bounded by 152.4m (500 ft) landside of the levee (as measured perpendicular to the centerline of the levee) and 457.2m (1,500 ft) or top bank riverside of the levee. This area is located in Crittenden County, Arkansas, and is shown on the Jericho, Arkansas-Tennessee, 15 minute quadrangle map.

C-2.5. Caruthersville (R-846). Within an imaginary plane figure beginning at station 26/0+00 and proceeding to station 28/0+00 bounded by top bank riverside of the levee. The area is located in Pemiscot County, Missouri, and is shown on the Caruthersville, Missouri-Tennessee-Arkansas, 15 minute quadrangle map.

C-2.6. Above Dorena, Parcel 2 (R-929). Within an imaginary plane figure beginning at station 60/38+00 and proceeding to station 62/34+00 bounded by 152.4m (500 ft) landside of the levee and 457.2m (1,500 ft) or top bank riverside of the levee. This area is located in Mississippi County, Missouri and is shown on the Hickman, Kentucky-Missouri-Tennessee 15 minute quadrangle map.

C-2.7. Nash Well Relief Channels (R-48.87 a.c.).

a. Ditch A. Within an imaginary plane figure beginning at station 8/34+00 and proceeding northeast along the toe of the existing levee to station 9/22+50; thence proceeding southeast to a point 107m (350 ft) distant from the toe of the levee; thence proceeding southwest and maintaining the 107m (350 ft) corridor to station 9/16+50; then proceeding to the northwest for 46m (150 ft); here turning again to the southwest and proceeding to station 8/34+00 while maintaining the 61m (200 ft) distance from the toe of the existing levee; and turning to close the figure. The work area is located within Cape Girardeau County, Missouri, and appears on the Morley, Missouri, 15 minute quadrangle map.

b. Ditch B. Within an imaginary plane figure beginning at station 9/22+50 and proceeding northeast along the toe of the existing levee to station 9/42+78; then turning roughly southwest to follow the proximal RR ROW limit (15m (50 ft) from the RR centerline) to a point 30m (100 ft) distant from the centerline of Ditch B at station 9/24+00 and moving south-southeast another 61m (200 ft); then proceeding to the southwest to station 9/22+50 while maintaining the 91m (300 ft) distance from the centerline of Ditch B and finally turning to close the figure. Ditch B is in Cape Girardeau County, Missouri, and is shown on the Morley, Missouri, 15 minute quadrangle map.

c. Ditch C. Within an imaginary plane figure beginning at station 11/0+00 and proceeding southwest along the proximal RR ROW limit until reaching station 9/45+00; thence proceeding roughly south for 4m (12 ft); then proceeding to the northeast to a point 8m (25 ft) distant from the RR ROW limit at station 9/50+00. Continuing to a point 9m (30 ft) distant from the RR ROW limit at station 10/16+00; now proceeding to the northeast to a point 46m (150 ft) distant from the RR ROW limit at station 10/19+00 and continuing

to the northeast to a point also 46m (150 ft) distant from the RR ROW limit at station 10/48+50; thence proceeding northwest for 21m (70 ft) and again proceeding northeast to a point 30m (100 ft) distant from the proximal RR ROW limit at station 11/0+00; thence turning to close the figure. The work area is within Cape Girardeau County, Missouri, and shown on the Morley, Missouri, 15 minute quadrangle map.

d. Ditch D. Within an imaginary plane figure beginning at station 13/7+59 and using the distal top bank of existing Ditch D as the southern boundary; proceeding west to Station 11/4+80; thence proceeding roughly north to the toe of the existing levee and following this line to the east (allowing for the inclusion of the illustrated disposal area), and closing the figure at station 13/7+59. Now beginning at station 11/4+80 proceeding southwest along the proximal boundary of the Railway right-of-way (RR ROW) (50 feet from the centerline of the tracks) to station 11/0+00; thence roughly south to a point 98m (320 ft) distant; then proceeding northeast and maintaining the 98m (320 ft) corridor; now turning to close the figure at station 11/4+80. These areas are shown on drawings 3 and 4, provided by the Government. The work area is with Cape Girardeau County, Missouri, and is shown on the Morley, Missouri, 15 minute quadrangle map.

e. Ditch Number One. There shall be a channel and floodway, hereinafter called Ditch Number One, constructed along a center line beginning at the northeast corner of the northwest quarter of Section Thirty-six, Township Thirty, Range Thirteen, thence west to the northwest corner of Section Thirty-five in said Township; thence south to the quarter section corner on the west line of Section Thirty-five; thence west through the middle of Sections Thirty-four and Thirty-three, to the quarter corner of the west line of Section Thirty-three; thence south to a point five hundred feet south of the southwest corner of said Section Thirty-three; thence south sixty-two degrees and thirty minutes west, seventy-three hundred feet; thence south twelve hundred and fifty feet to a point one hundred feet south of the center of the Saint Louis-Southwestern Railway, eight hundred and fifty feet west of its crossing with the Saint Louis, Memphis & Southeastern Railway in Section Five, Township Twenty-nine, Range Thirteen; thence south fifty-four degrees west, sixteen thousand feet (intersecting the west line of Section Thirteen, Township Twenty-nine, Range Twelve eleven hundred feet north of the quarter section corner, on the west line of said Section); thence south thirty-five degrees west, eighteen thousand three hundred feet, to a point six hundred and eighty feet south of the northeast corner of Section Thirty-three, Township Twenty-nine, Range Twelve; thence south to the southeast corner of said Section; thence south thirteen degrees west, to the southwest corner of the southeast quarter of the southeast quarter of Section Four, Township Twenty-eight, Range Twelve. Work area located within Scott County, Missouri, and shown on the Morley, Missouri, 15 minute quadrangle map. The work shall be performed within the impact areas as illustrated by drawings 21876; 101/356 (5), (6) and (7).

f. Ditch Number Four. Ditch Number Four is located along a center line beginning at the west side of the Rock Levee Road in the northeast quarter of Section Twenty-five, Township Thirty, Range Thirteen, and Twenty-five feet north of the south line of the right-of-way, described for Whitewater River

Deflection Channel and Levee, and extending west, parallel with said right-of-way line to a point fifty feet distant (measured at right angles) from the south right-of-way line at the St. Louis and San Francisco Railroad in Section Twenty-seven in said Township, thence southwest parallel to said railroad to the west line of Section Twenty-seven in said township, thence south along the west lines of sections Twenty seven and Thirty-four to intersect Ditch Number One. The work is within Scott and Cape Girardeau Counties, Missouri, and is shown on the Morley, Missouri, 15 minute quadrangle map. The work shall be performed within the impact area as illustrated by drawing 21876; 101/356(5).

g. Ditch Number Eight. Ditch Number Eight is located along a center line, beginning seventy feet, north twenty-eight degrees east from the trestle on the Saint Louis, Memphis & Southeastern Railroad, two thousand three hundred feet west of the east line of Section Twenty-nine, Township Thirty, Range Thirteen, measured along said Railroad; thence South Twenty-eight degrees west, ninety six hundred feet (intersecting the south line of Section Thirty-two in said Township, one hundred feet east of the southwest corner); thence south thirteen hundred feet to the intersection with Ditch Number One. The ditch alignment follows, in part, the boundary of Scott and Cape Girardeau Counties and appears on the Morley, Missouri, 15 minute quadrangle map. The work shall be performed within the impact area as illustrated by drawing 21876; 101/356(8).

C-3. DEFINITIONS.

C-3.1. "Cultural resources" are defined to include any buildings, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

C-3.2. "Background and Literature Search" is defined as a comprehensive examination of existing literature and records for the purpose of inferring the potential presence and character of cultural resources in the study area. The examination may also serve as collateral information to field data in evaluating the eligibility of cultural resources for inclusion in the National Register of Historic Places or in ameliorating losses of significant data in such resources.

C-3.3. "Intensive Survey" is defined as a comprehensive, systematic, and detailed on-the-ground survey of an area, of sufficient intensity to determine the number, types, extent and distribution of cultural resources present and their relationship to project features.

C-3.4. "Mitigation" is defined as the amelioration of losses of significant prehistoric, historic, or architectural resources which will be accomplished through preplanned actions to avoid, preserve, protect, or minimize adverse effect upon such resources or to recover a representative sample of the data they contain by implementation of scientific research and other professional techniques and procedures. Mitigation of losses of cultural resources includes, but is not limited to, such measures as: (1) recovery and preservation of an adequate sample of archeological data to allow for analysis and published interpretation of the cultural and environmental conditions prevailing at the time(s) the area was utilized by man; (2) recording, through

architectural quality photographs and/or measured drawings of buildings, structures, districts, sites and objects and deposition of such documentation in the Library of Congress as a part of the National Architectural and Engineering Record; (3) relocation of buildings, structures and objects; (4) modification of plans or authorized projects to provide for preservation of resources in place; (5) reduction or elimination of impacts by engineering solutions to avoid mechanical effects of wave wash, scour, sedimentation and related processes and the effects of saturation.

C-3.5. "Reconnaissance" is defined as an on-the-ground examination of selected portions of the study area, and related analysis adequate to assess the general nature of resources in the overall study area and the probable impact on resources of alternate plans under consideration. Normally reconnaissance will involve the intensive examination of not more than 15 percent of the total proposed impact area.

C-3.6. "Significance" is attributable to those cultural resources of historical, architectural, or archeological value when such properties are included in or have been determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places after evaluation against the criteria contained in How to Complete National Register Forms.

C-3.7. "Testing" is defined as the systematic removal of the scientific, prehistoric, historic, and/or archeological data that provide an archeological or architectural property with its research or data value. Testing may include controlled surface survey, shovel testing, profiling, and limited subsurface test excavations of the properties to be affected for purposes of research planning, the development of specific plans for research activities and excavation, preparation of notes and records, and other forms of physical removal of data and the analysis of such data and material, preparation of reports on such data and material and dissemination of reports and other products of the research. Subsurface testing shall not proceed to the level of mitigation.

C-3.8. "Analysis" is the systematic examination of material data, environmental data, ethnographic data, written records, or other data which may be prerequisite to adequately evaluating those qualities of cultural loci which contribute to their significance.

C-4. GENERAL PERFORMANCE SPECIFICATIONS

C-4.1. The Contractor shall prepare for each of the project areas a draft and final report detailing the results of the individual studies and subsequent recommendations.

C-4.2 Background and Literature Search

a. This task shall include an examination of the historic and prehistoric environmental setting and cultural background of the study area and shall be

of sufficient magnitude to achieve a detailed understanding of the overall cultural and environmental context of the study area. It is axiomatic that the background and literature search shall normally precede the initiation of all fieldwork.

b. Information and data for the literature search shall be obtained, as appropriate, from the following sources: (1) Scholarly reports - books, journals, theses, dissertations and unpublished papers; (2) Official Records - Federal, state, county and local levels, property deeds, public works and other regulatory department records and maps; (3) Libraries and Museums - both regional and local libraries, historical societies, universities, and museums; (4) Other repositories - such as private collections, papers, photographs, etc.; (5) archeological site files at local universities, the State Historic Preservation Office, the office of the State Archeologist; (6) Consultation with qualified professionals familiar with the cultural resources in the area, as well as consultation with professionals in associated areas such as history, sedimentology, geomorphology, agronomy, and ethnology.

c. The Contractor shall include as an appendix to the draft and final reports written evidence of all consultation and any subsequent response(s), including the dates of such consultation and communications.

d. The background and literature search shall be performed in such a manner as to facilitate predictive statements (to be included in the study report) concerning the probable quantity, character, and distribution of cultural resources within the project area. In addition, information obtained in the background and literature search should be of such scope and detail as to serve as an adequate data base for subsequent field work and analysis in the study area undertaken for the purpose of discerning the character, distribution and significance of identified cultural resources.

e. In order to accomplish the objectives described in paragraph 4.02.d., it will be necessary to attempt to establish a relationship between landforms and the patterns of their utilization by successive groups of human inhabitants. This task should involve defining and describing various zones of the study area with specific reference to such variables as past topography, potential food resources, soils, geology, and river channel history.

C-4.3. Intensive Survey.

a. Intensive Survey shall include the on-the-ground examination of the project areas described in paragraph 2.0 sufficiently to insure the location and preliminary evaluation of all cultural resources in the study area and to fulfill report requirements.

b. Unless excellent ground visibility and other conditions conducive to the observation of cultural evidence occurs, shovel test pits, or comparable

subsurface excavation units, shall be installed at intervals no greater than 30 meters throughout the study area. Note that auger samples, probes, and coring tools will not be considered comparable subsurface units. Shovel test pits shall be minimally 30 x 30 centimeters in size and extend to a minimum depth of 50 centimeters. All such units shall be screened using 1/2" mesh hardware cloth. Additional shovel test pits shall be excavated in areas judged by the Principal Investigator to display a high potential for the presence of cultural resources. If, during the course of intensive survey activities, areas are encountered in which disturbance or other factors clearly and decisively preclude the possible presence of significant cultural resources, the Contractor shall carefully examine and document the nature and extent of the factors and then proceed with survey activities in the remainder of the study area. Documentation and justification of such action shall appear in the survey report. The location of all shovel test units and surface observations with respect to site geometry shall be recorded and appear in the draft and final reports.

c. When cultural remains are encountered, horizontal site boundaries shall be derived by the use of surface observation procedures (where surface conditions are highly conducive to the observation of cultural evidence) or by screened shovel cut units or by a combination of these methods and in such a manner as to allow precise location of site boundaries on Government project drawings and 7.5 minute U.S.G.S. quad maps when available. Methods used to establish site boundaries shall be discussed in the survey report together with the probable accuracy of the boundaries. The Contractor shall establish a datum at the discovered cultural loci which shall be precisely related to the site boundaries as well as to a permanent reference point (in terms of azimuth and distance). If possible, the permanent reference point used shall appear on Government blue-line (project) drawings and/or 7.5 minute U.S.C.S. quad maps. If no permanent landmark is available, a permanent datum shall be established in a secure location for use as a reference point. The permanent datum shall be precisely plotted and shown on U.S.G.S. quad maps and project drawings. All descriptions of site location shall refer to the location of the primary site datum.

d. Upon approval of the Contracting Officer or his authorized representative, the delineation of precise site boundaries may be deferred until the implementation of testing activities.

C-4.4 Testing Activities

a. Initial Site Testing

(1) Surface collection of the site area shall be accomplished in order to obtain data representative of total site surface content. Both historic and prehistoric items shall be collected. The Contractor shall carefully note and record descriptions of surface conditions of the site including ground cover and the suitability of soil surfaces for detecting cultural items (ex: recent rainfall, standing water or mud). If ground surfaces are not highly conducive to surface collection, screened shovel test units shall be used to augment surface collection procedures.

(2) Care should be taken to avoid bias in collecting certain classes of data or artifact types to the exclusion of others (ex: debitage or faunal remains) so as to insure that collections accurately reflect both the full range and the relative proportions of data classes present (ex: the proportion of debitage to implements or types of implements to each other). Such a collecting strategy shall require the total collection of quadrat or other sample units in sufficient quantities to reasonably assure that sample data are representative of such discrete site subareas as may exist. Since the number and placement of such sample units will depend, in part, on the subjective evaluation of intrasite variability, and the amount of ground cover, the Contractor shall describe the rationale for the number and distribution of collection units. In the event that the Contractor utilizes systematic sampling procedures in obtaining representative surface samples, care should be taken to avoid periodicity in recovered data. No individual sample unit type used in surface data collection shall exceed 6 square meters in area.

(3) The Contractor shall undertake (in addition and subsequent to sample surface collecting) a general site collection in order to increase the sample size of certain classes of data which the Principal Investigator may deem prerequisite to an adequate site-specific and intersite evaluation of data.

(4) As an alternative to surface collecting procedures discussed above, where surface visibility is excellent, the Contractor may collect all visible artifacts. If such a procedure is undertaken, the precise proveniences of all individual artifacts shall be related to the primary site datum and recorded.

(5) Unless it can be conclusively and definitely demonstrated that no significant subsurface cultural resources occur at a site, the Contractor shall install in each appropriate site a minimum of one 1 X 1 meter subsurface test unit to determine the presence and general nature of subsurface deposits.

(6) Subsurface test units (other than shovel out units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present, however, excavated materials shall be removed by zones (and in 10 cm. levels within zones where possible). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 X 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated material (including plow zone material) shall be screened using a minimum of 1/4" hardware cloth. Representative profile drawings shall be made of excavated unit. Subsequent to preparation of profile drawings for each test unit, the unit shall be backfilled and compacted to provide reasonable pedestrian safety.

(7) During the course of the intensive survey, the Contractor should observe and record local environmental, physiographic, geological or other variables (including estimates of ground visibility and descriptions of soil characteristics) which may be useful in evaluating the effectiveness of survey procedures and providing comparative data for use in predictive statements which may be utilized in future Government cultural resource investigations.

(8) When sites are not wholly contained within the right-of-way limits, the Contractor shall survey an area outside the right-of-way limits large enough to include the entire site within the survey area. This shall be done in an effort to delineate site boundaries and to determine the degree to which the site will be impacted.

b. Additional Site Testing

(1) Multiple 1 X 1 meter subsurface test units may be required at many sites. The proposed number and distribution of such test units shall be determined by the Principal Investigator on a site specific basis. This determination shall be made based on such variables as site size and potential intrasite variability, including physiographic and geomorphological characteristics of the loci which may suggest variability in the presence or distribution of subsurface cultural deposits. The Contractor shall detail the rationale(s) for the placement and numbers of such test units in the report of field activities. The placement and numbers of additional test units shall be negotiated with the Contracting Officer and if an agreement is reached a change order shall be issued prior to conduct of the work. Such testing will provide a data base of sufficient nature to allow a determination of site eligibility to the National Register of Historic Places.

(2) Subsurface test units (other than shovel cut units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present, however, excavated materials shall be removed by zones (and in 10 cm levels within zones where appropriate). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 X 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated material (including plow zone material) shall be screened using a minimum of 1/4" hardware cloth. Representative profile drawings shall be made of excavated units.

(3) Stringent horizontal spatial control of testing will be maintained by relating the location of all collection and test units to the primary site datum.

(4) Other types of subsurface units may, at the Contractor's option, be utilized in addition to those units required by this Scope of Work.

(5) Subsurface investigations will be limited to testing and shall not proceed to the level of mitigation.

(6) In order to accurately relate a site to research domains, i.e., assess significance or insignificance, a variety of data gathering techniques may be required to insure recovery of the various types of data which may be present at the site. These techniques may include but not be limited to flotation and excavation of cultural features. When appropriate, these types of data gathering activities should be integral elements of the testing strategy.

C-4.5. Analysis and Curation. Unless otherwise indicated, artifactual and non-artifactual analysis shall be of an adequate level and nature to fulfill the requirements of this Scope of Work. All recovered cultural items shall be cataloged in a manner consistent with state requirements or standards of curation in the state in which the study occurs. The Contractor shall consult with appropriate state officials as soon as possible following the conclusion of fieldwork in order to obtain information (ex: accession numbers) prerequisite to such cataloging procedures. The Contractor shall have access to a depository for notes, photographs and artifacts (preferably in the state in which the study occurs) where they can be permanently available for study by qualified scholars. If such materials are not in Federal ownership, applicable state laws, if any, should be followed concerning the disposition of the materials after the completion of the final report. Efforts to insure the permanent curation of properly cataloged cultural resources materials in an appropriate institution shall be considered an integral part of the requirements of this Scope of Work.

C-5. GENERAL REPORT REQUIREMENTS.

C-5.1. The primary purpose of the cultural resources report is to serve as a planning tool which aids the Government in meeting its obligations to preserve and protect our cultural heritage. The report will be in the form of a comprehensive, scholarly document that not only fulfills mandated legal requirements but also serves as a scientific reference for future cultural resources studies. As such, the report's content must be not only descriptive but also analytic in nature.

C-5.2. Upon completion of all field investigation and research, the Contractor shall prepare reports detailing the work accomplished, the results, the recommendations, and appropriate alternative mitigation measures, when required, for each project area. The format suggested by Guidelines for Contract Cultural Resource Survey Reports and Professional Qualifications as prepared by the Missouri Department of Natural Resources should be reviewed and, to the extent allowed by this Scope of Work utilized as an aid in preparing the required report for work in Missouri. To the extent permitted by this Scope of Work, the work in Arkansas shall follow the Standards for Fieldwork and Reports as prepared by the Arkansas Archeological Survey.

C-5.3. The report shall include, but not necessarily be limited to, the following sections and items:

- a. Title Page. The title page should provide the following information; the type of task undertaken, the cultural resources which were assessed (archeological, historical, architectural); the project name and location (county and state), the date of the report; the Contractor's name; the contract number; the name of the author(s) and/or the Principal Investigator; and the agency for which the report is being prepared.
- b. Abstract. The abstract should include a summary of the number and types of resources which were surveyed, results of activities and the recommendations of the Principal Investigator.
- c. Table of Contents.
- d. Introduction. This section shall include the purpose of the report; a description of the proposed project; a map of the general area; a project map; and the dates during which the task was conducted. The introduction shall also contain the name of the institution where recovered materials will be curated.
- e. Environmental Context. This section shall contain, but not be limited to, a discussion of probable past floral and faunal characteristics of the project area. Since data in this section will be used in the evaluation of specific cultural resource significance, it is imperative that the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activities and environmental variables.
- f. Previous Research. This section shall describe previous research which may be useful in deriving or interpreting relevant background research data, problem domains, or research questions and in providing a context in which to examine the probability of occurrence and significance of cultural resources in the study area.
- g. Literature Search and Personal Interviews. This section shall discuss the results of the literature search, including specific data sources, and personal interviews which were conducted during the course of investigations.
- h. Survey, Testing and Analytical Methods. This section shall contain an explicit discussion of research and/or survey strategy, and should demonstrate how environmental data, previous research data, the literature search and personal interviews have been utilized in constructing such a strategy.
- i. Survey, Testing and Analytical Results. This section shall discuss archeological, architectural, and historical resources surveyed, tested and analyzed; the nature and results of analysis, and the scientific importance or significance of the work. Quantified listings and descriptions of artifacts and their proveniences may be included in this section or added to the report as an appendix. Inventoried sites shall include a site number.

j. Recommendations.

(1) This section should contain the recommendations of the Principal Investigator based on the significance and degree of impact of the project on the cultural resources. Assessment of the eligibility of specific cultural properties for inclusion in the National Register of Historic Places shall be made for cultural resources.

(2) It will not be considered adequate to evaluate a resource on the basis of inferred potential with a recommendation for further testing in order to determine significance. Significance should be discussed explicitly in terms of previous regional and local research and relevant problem domains. Statements concerning significance shall contain a detailed, well-reasoned argument for the property's research potential in contributing to the understanding of cultural patterns, processes or activities important to the history or prehistory of the locality, region or nation, or other criteria of significance. Conclusions concerning insignificance likewise, shall be fully documented and contain detailed and well-reasoned arguments as to why the property fails to display adequate research potential or other characteristics adequate to meet National Register criteria of significance. For example, conclusions concerning significance or insignificance relating solely to the lack of contextual integrity due to plow disturbance or the lack of subsurface deposits will be considered inadequate. Where appropriate, due consideration should be given to the data potential of such variables as site functional characteristics, horizontal intersite or intrasite spatial patterning of data and the importance of the site as a representative systemic element in the patterning of human behavior. The Contractor should be guided, in this regard, by Archeological Property Nominations by Tom King (Published in 11593, Vol. 1, No. 2). All report conclusions and recommendations shall be logically and explicitly derived from data discussed in the report.

(3) The significance or insignificance of cultural resources can be determined adequately only within the context of the most recent available local and regional data base. Consequently the evaluation of specific individual cultural loci examined during the course of contract activities shall relate these resources not only to previously known cultural data but also to a synthesized interrelated corpus of data generated in the present study.

(4) The Contractor shall provide appropriate alternative mitigation measures for significant resources which will be adversely impacted. Data will be provided to support the need for mitigation and the relative merits of each mitigation design will be discussed. The Contractor shall also provide time and cost estimates for implementation of each mitigation design. Time and cost estimates may be submitted as a readily removable appendix. The impact of destruction or alteration of a cultural resource should be measured against the extent to which that resource contributes to the understanding of man's activities in the region, its potential for future research and its preservability. Preservation of significant cultural resources is nearly always considered preferable to recovery of data through excavation. When a significant site can be preserved for an amount reasonably comparable to, or less than the amount required to recover the data, full consideration shall be given to this course of action.

*. References (American Antiquity style).

1. Appendices (Maps, correspondence, etc.). A copy of this Scope of Work shall be included as an appendix in all reports.

C-5.4. The above items do not necessarily have to be discrete sections; however, they should be readily discernable to the reader. The detail of the above items may vary somewhat with the purpose and nature of the study.

C-5.5. In order to prevent potential damage to cultural resources, no information shall appear in the body of the report which would reveal precise resource location. All maps which indicate or imply precise site locations shall be included in reports as a readily removable appendix (ex: envelope).

C-5.6. No logo or other such organizational designation shall appear in any part of the report (including tables or figures) other than the title page.

C-5.7. Unless specifically authorized by the Contracting Officer, all reports shall utilize permanent site numbers assigned by the state in which the study occurs.

C-5.8. All appropriate information (including typologies and other classificatory units) not generated in these contract activities shall be suitably referenced.

C-5.9. Reports detailing testing activities shall contain site specific maps. Site maps shall indicate site datum(s), location of data collection units (including shovel cuts, subsurface test units and surface collection units); site boundaries in relation to proposed project activities, site grid systems (where appropriate) and such other items as the Contractor may deem appropriate to the purposes of this contract.

C-5.10. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective and advantageous to communicate necessary information. All tables, figures and maps appearing in the report shall be of publishable quality.

C-5.11. Any abbreviated phrases used in the text shall be spelled out when the phrase first occurs in the text. For example use "State Historic Preservation Officer (SHPO)" in the initial reference and thereafter "SHPO" may be used.

C-5.12. The first time the common name of a biological species is used it should be followed by the scientific name.

C-5.13. In addition to street addresses or property names, sites shall be located on the Universal Transverse Mercator (UTM) grid.

C-5.14. All measurements should be metric. If the Contractor's equipment is in the English system, then the metric equivalents should follow in parentheses.

C-5.15. As appropriate, diagnostic and/or unique artifacts, cultural resources or their contexts shall be shown by drawings or photographs.

C-5.16. Black and white photographs are preferred except when color changes are important for understanding the data being presented. No instant type photographs may be used.

C-5.17. Negatives of all black and white photographs and/or color slides of all plates included in the final report shall be submitted so that copies for distribution can be made.

C-6. SUBMITTALS.

C-6.1. A brief management summary describing the approximate size and general nature of all cultural resources detected shall be supplied to the Contracting Officer within 10 days of the completion of intensive survey field activity.

C-6.2. The Contractor shall submit 10 copies of the draft report and one original and 50 bound copies each of the final report which include appropriate revisions in response to the Contracting Officer's comments.

C-6.3. The Contractor shall submit under separate cover 6 copies of appropriate 15' quadrangle maps (7.5' when available) or other site drawings which show exact boundaries of all cultural resources within the project area and their relationship to project features, and single copies of all forms, records and photographs described in paragraph 1.04.

C-6.4. The Contractor shall submit to the Contracting Officer completed National Register forms including photographs, maps, and drawings in accordance with the National Register Program if any sites inventoried during the survey are found to meet the criteria of eligibility for nomination and for determination of significance. The completed National Register forms are to be submitted with the final report.

C-6.5. At any time during the period of service of this contract, upon the written request of the Contracting Officer, the Contractor shall submit, within 30 calendar days, any portion or all field records described in paragraph 1.04 without additional cost to the Government.

C-6.6. When cultural resources are located during intensive survey activities, the Contractor shall supply the appropriate State Historic Preservation Office with completed site forms, survey report summary sheets, maps or other forms as appropriate. Blank forms may be obtained from the State Historic Preservation Office. Copies of such completed forms and maps shall be submitted to the Contracting Officer within 30 calendar days of the end of fieldwork.

C-6.7. The Contractor shall prepare and submit with the final report, a site card for each identified resource or aggregate resource. These site cards do

not replace state approved prehistoric, historic, or architectural forms or Contractor designed forms. These 5 X 8 inch cards shall be color-coded. White cards shall be used for prehistoric sites, blue cards for historic sites, green for architectural sites and yellow cards for potentially significant sites. Sites fitting two or more categories will have two or more appropriate cards. This site card shall contain the following information, to the degree permitted by the type of study authorized:

- a. site number
- b. site name
- c. location: section, township, and UTM coordinates (for procedures in determining UTM coordinates, refer to How to Complete National Register Forms, National Register Program, Volume 2.
- d. county and state
- e. quad maps
- f. date of record
- g. description of site
- h. condition of site
- i. test excavation results
- j. typical artifacts
- k. chronological position (if known)
- l. relation to project
- m. previous studies and present contract number
- n. additional remarks

C-7. SCHEDULE.

C-7.1. The Contractor shall, unless delayed due to causes beyond his control and without his fault or negligence, complete all work and services under this contract within the following time limitations.

<u>Activity</u>	<u>Completion Time</u> (In days beginning with acknowledged date of receipt of notice to proceed)	
Porter Lake, AR (R-703)	draft report	40
	final report	95
Nash Well Relief Channels, MO (R48.87 a.c.)	draft report	70
	final report	115
Caruthersville, MO (R-846)	draft report	80
	final report	115
Lambethville, AR (R-752)	draft report	220
	final report	295
Knowlton, AR (R-618)	draft report	280
	final report	355
Henrico, AR (R-606)	draft report	340
	final report	415
Above Dorena, Parcel 2, MO (R-929)	draft report	400
	final report	475

C-7.2. The Contractor shall make any required corrections after review by the Contracting Officer of the reports. In the event that any of the Government review periods (55 days) are exceeded and upon request of the Contractor, the contract period will be extended on a calendar day for day basis. Such extension shall be granted at no additional cost to the Government.

APPENDIX B
SITE DESCRIPTIONS

APPENDIX B

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APPENDIX B

NLU-83-203

Location and Physical Setting

This is the location of an isolated find (Figure B-1) located in a plowed field that has been utilized as a borrow pit. The area has also been subject to deforestation and land leveling. The elevation of the spot find was approximately 48.76 meters (160 feet) AMSL and was approximately 75 meters (246 meters) west of the top bank of the Mississippi River. Prior to the land modification the soils were of the Sharkey-Commerce-Coushatta association (Gill et al 1972). The field was planted in soybeans at the time of the survey.

Site History

This area is one that has been considerably modified in recent years by borrow pit activities, land clearing and land leveling. In 1982 land leveling was done on this site immediately after work was done in the vicinity of NLU-83-205 (Phillip Gattis 1983:personal communication). The latter site is just east of the levee from the presently discussed location and it would appear that the two sherds found here were imported on the tires or treads of the machinery that worked at both sites.

Methodology

This location was observed during the on-the-ground survey of the area. Intensive ground survey was carried out in the vicinity and no further cultural material was located.

The location was flagged and marked on large scale aerial blueline maps for return investigation. When revisited, a series of 30 x 30 x 50 centimeter shovel tests were excavated radiating out from the find location at 10 meter intervals. All materix from these tests were passed through 1/4 inch steel mesh. No subsurface cultural material or features were encountered. Further, intensive ground survey was also done at this time and no further cultural remains were found. The location of the artifacts was mapped in with a transit and stadia rod. Permanent datums were established at navigation tower 618 and a large tree into which a nail was driven.

Stratigraphy

Shovel tests profiles were all similar in composition. A typical profile is described below and is depicted in Figure B-2.

Shovel Test Profile:

- 0-30 cm: dark brown (10YR5/2) sandy silt, no cultural material;
- 30-50 cm: dark brown (10YR4/3) sandy silt, no cultural material.

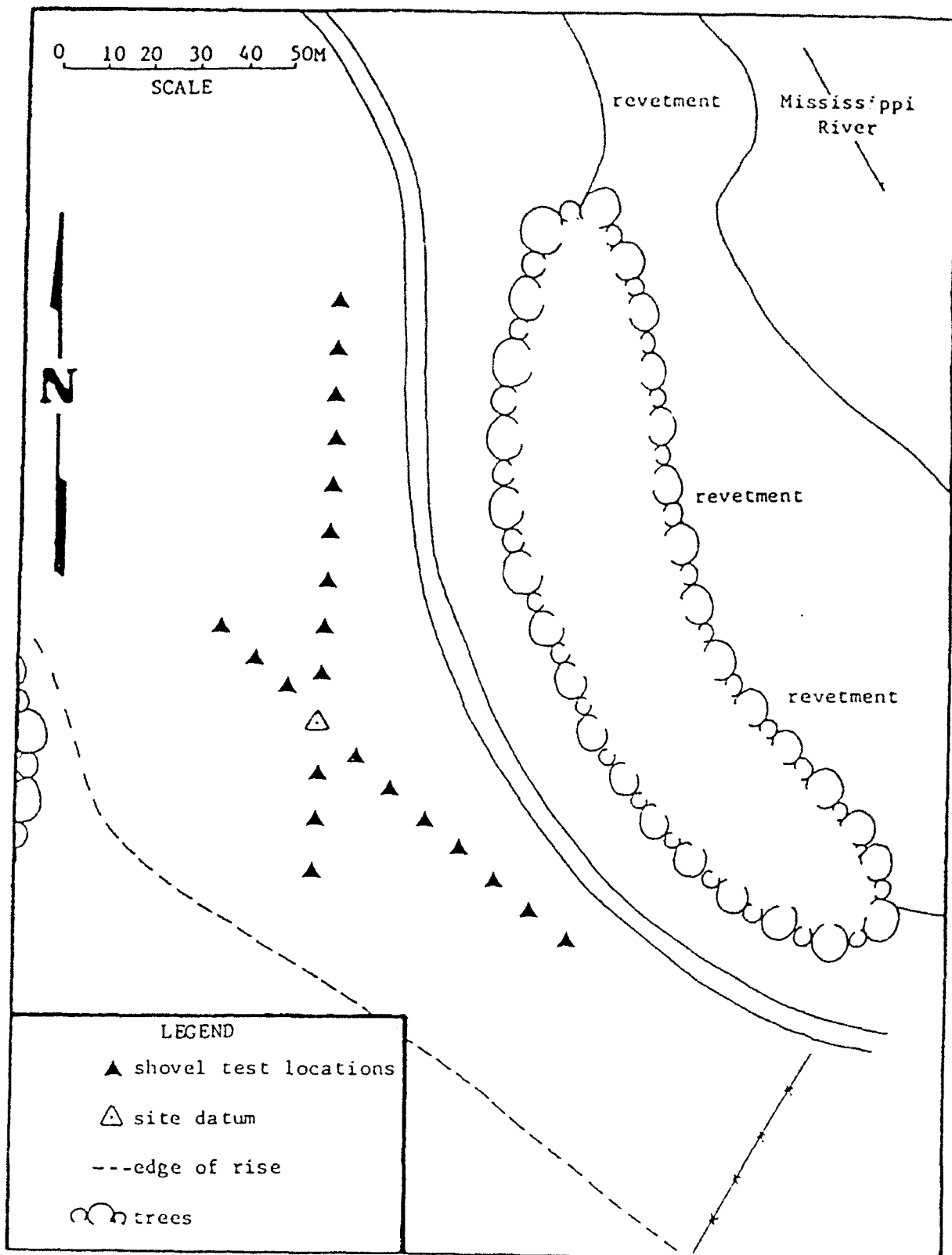


Figure B.1 Location map NLL-83-203

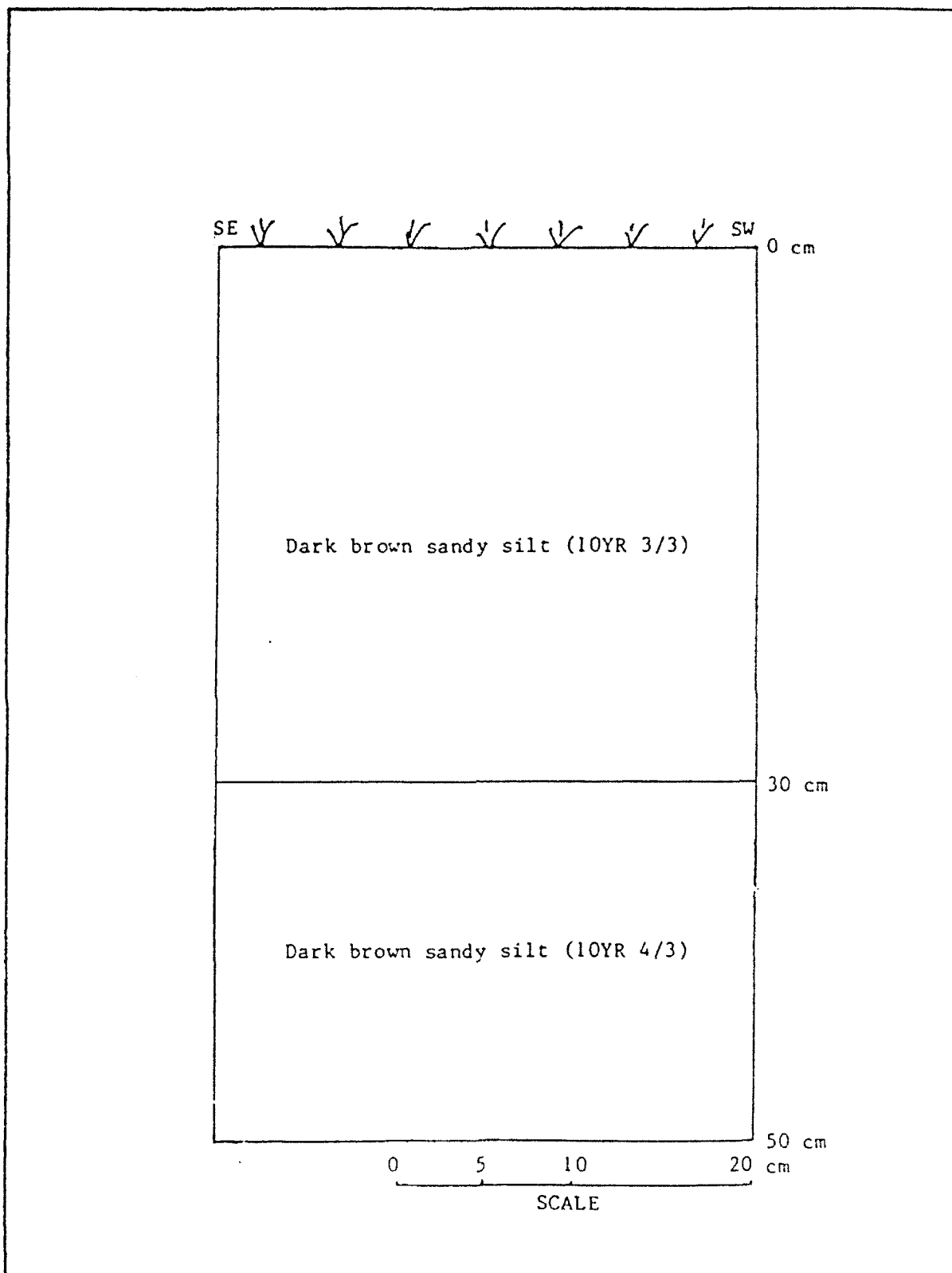


Figure B.2 South wall profile NLU-83-203

Artifacts

The isolated find consists of two undecorated prehistoric shell tempered ceramic sherds. One is 3.0 centimeters x 1.7 centimeters and 0.7 centimeters thick. It has a very pale brown (10YR7/3) exterior, a reddish-yellow (7.5YR7/6) interior and a dark gray (7.5YR4/0) core. The second sherd is 1.7 centimeters in diameter and 0.6 centimeters thick. It has a brown (10YR5/3) exterior, a reddish-yellow (7.5YR6/6) interior and a dark gray (10YR4/1) core. These sherds appear to be from the late Mississippian period.

Site Size, Distribution and Interpretation Based on Investigations

As a result of intensive on-the-ground investigations and consultation with the land owner, it was ascertained that the artifacts found at this location were the result of redeposition, probably from 3DE18 (NLU-83-205).

NLU-83-204

Location and Physical Setting

This architectural site lies at the base of present levee on the land side on the level alluvial floodplain. The elevation is approximately 48.8 meters (160 feet) AMSL. Soils are Bruno loamy sand, gently undulating (Gill et al 1972).

Site History

No buildings are shown at this location on the Mississippi River Commission Maps of 1882 although the land was cleared and in cotton production. It was owned by P. K. Knowlton at this time.

The earliest available topographic quadrangle (U.S. Army Corps of Engineers 15' Mellwood 1930) indicates buildings at this site as do the subsequent 1936, 1939, 1954 and 1962 quadrangles. The complex is presently owned by Brooks Griffin of Mellwood, Arkansas, who rents it to tenants. McNerney and White (1982:87-88) documented this complex in their survey of this area.

Methodology

This architectural site was located during the on-the-ground survey of the area. The structures were described and photographed at this time. No sub-surface testing was done at this location. The southwest corner of the bungalow was mapped in using a transit. A permanent datum was established at a gate and cattle guard corner post on the levee overlooking the site. A nail was driven into this post.

Site Size, Distribution and Interpretation Based on Investigations

This site is a complex of farm buildings covering an approximate area of 107 x 76 meters (350 x 250 feet). The first structure is a two-story bungalow with a window in the front gable. It has an attached porch, a center front door and a covered back porch. The foundation is raised on pilings. The roof is covered with asphalt shingles and the siding is tongue and groove.

The associated outbuildings are an outhouse, a small travel trailer, a small shed with a shed roof and two small transverse crib frame barns. The barns are apparently not in use and are becoming delapidated.

Based on type and archival information (U.S. Army Corps of Engineers, Mellwood 15' topographic quadrangle) this architectural site would appear to have been built sometime in the 1920's.

3DE18 (NLU-83-205)

Location and Physical Setting

This site (Figure B-3) occupies a slight rise within alluvial floodplain deposits at an elevation of approximately 47.24 meters (155 feet) AMSL. An intermittent stream that empties into Deep Bayou borders the western edge of the site, while the eastern edge is bordered by the present levee. It is probable that a portion of the site lies under the levee (Luther Miller 1983: personal communication).

The site has been cultivated for some years and a portion of the southern end was land leveled in 1982 (Philip Gattis 1983:personal communication). Soils in the area are Commerce silt loam (Gill et al 1972).

Site History

The site consists of both a prehistoric and historic component. Investigation has revealed that this site is the site reported by Jim Wood of Mosbey, Arkansas in 1969 and assigned the site number 3DE18. His original report places it 457.20 meters (1,500 feet) to the west of its real location (John House 1983:personal communication). Although not known by professional archeologists and missed by the various Mississippi River Surveys (Moore 1911; Phillips, Ford and Griffin 1951), local collectors have known of the site for years. Luther Miller of Mellwood, Arkansas reported that he knew of it as a boy in the 1940's (Miller 1983:personal communication). In the last 20 years some digging has occurred on the site but it does not appear heavily damaged by pothunting or cultivation.

Luther Miller has been the main collector of the site. Although he no longer has an extensive collection he still has a few vessels that are discussed in Appendix C.

Methodology

The presence of an Indian mound was reported to the survey on September 26, 1983 by Roy Sanderlin, one of the present owners of the land. The site was initially observed during the on-the-ground survey. At that time a moderate density surface scatter of prehistoric and historic artifacts, as well as human and animal bone was observed between the skip rows of cotton. Shovel tests, 30 x 30 x 50 centimeters, were spaced at 30 meter intervals along 30 meter wide transects. No subsurface cultural deposits or features were encountered.

The site location was plotted on project maps and flagged for return investigations. When revisited on October 2, 1983, the surface site limits

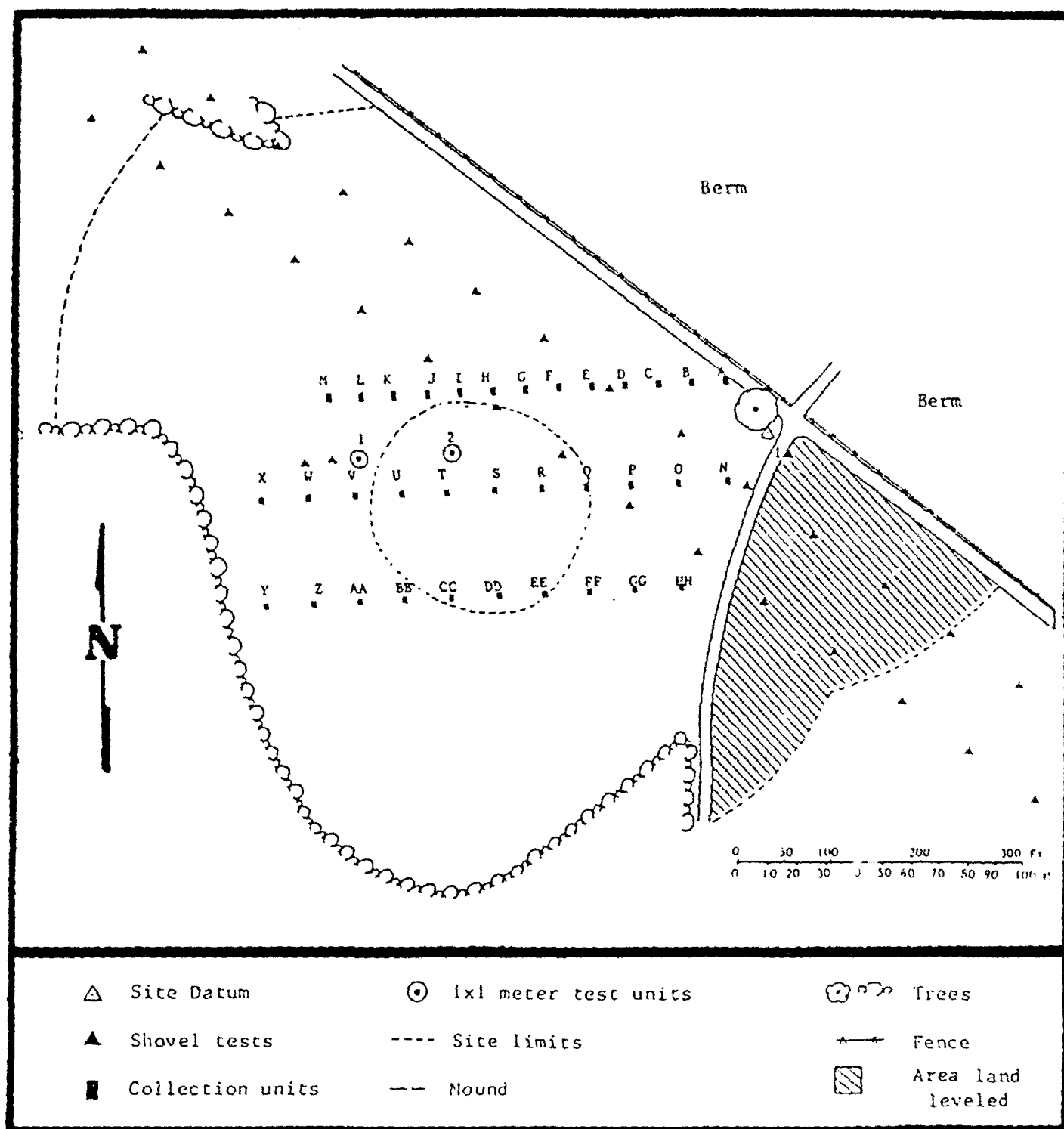


Figure B.3 Site map NLU-83-205

were determined and marked with flagged poles. Thirty-four 2 x 3 meter collection units were placed at the site in three rows parallel to the rows of cotton in the skip rows. The material on the surface within the collection units was systematically collected and each unit bagged separately.

Permanent datums were established at 1) a telephone company warning sign southeast of the site, 2) a gate post on the land side of a cattle guard on the levee northeast of the site and 3) a nail in the large pecan tree on the southeast corner of the site.

Mapping of the perimeter of the site was begun by two archeologists while two others finished collecting material from the collection units and began shovel testing in the southern portion of the site.

The lack of daylight interrupted these activities and work halted for the day. On October 3, 1983, the survey team returned to the site and resumed work.

From information gathered from observation shovel tests and random soil probes, two 1 x 1 meter test units were staked in areas where there appeared to be intact subsurface prehistoric cultural layer. Two archeologists began excavating the southern 1 x 1 test unit (test unit 2) while two others began the northern one (test unit 1). The southeast corner of each unit was flagged for subsequent mapping.

Test unit 1 was excavated in natural levels to a depth of 60 centimeters and all matrix was screened through 1/4 inch steel mesh. No subsurface cultural material was recovered from this test unit.

Test unit 2 had been excavated in natural levels to a depth of 30 centimeters when all activity on the site was interrupted by the appearance of a cropdusting airplane. This plane proceeded to apply defoliant to the site area. Due to this activity and the health hazard that contact with these chemicals entailed, the survey team left the area. As the effects of this material last in an area for some days, the site was not revisited by the survey team except very briefly the next day in order to pick up materials and fill the exposed test unit (test unit 2).

Stratigraphy

The south wall profile of the test unit 1 is depicted in Figure B-4. The profile observed is described below:

1 x 1 Meter Test Unit 1:

- 0-18 cm: plow zone - dark grayish-brown (10YR4/2) sandy silt;
- 18-30 cm: dark grayish-brown (10YR4/2) sandy silt;
- 30-40 cm: dark grayish-brown (10YR4/2) sandy silt with charcoal;
- 40-60 cm: very dark grayish (10YR3/1) silty clay.

Artifacts

The following artifacts collected from the site are listed in Table B-1 and discussed below.

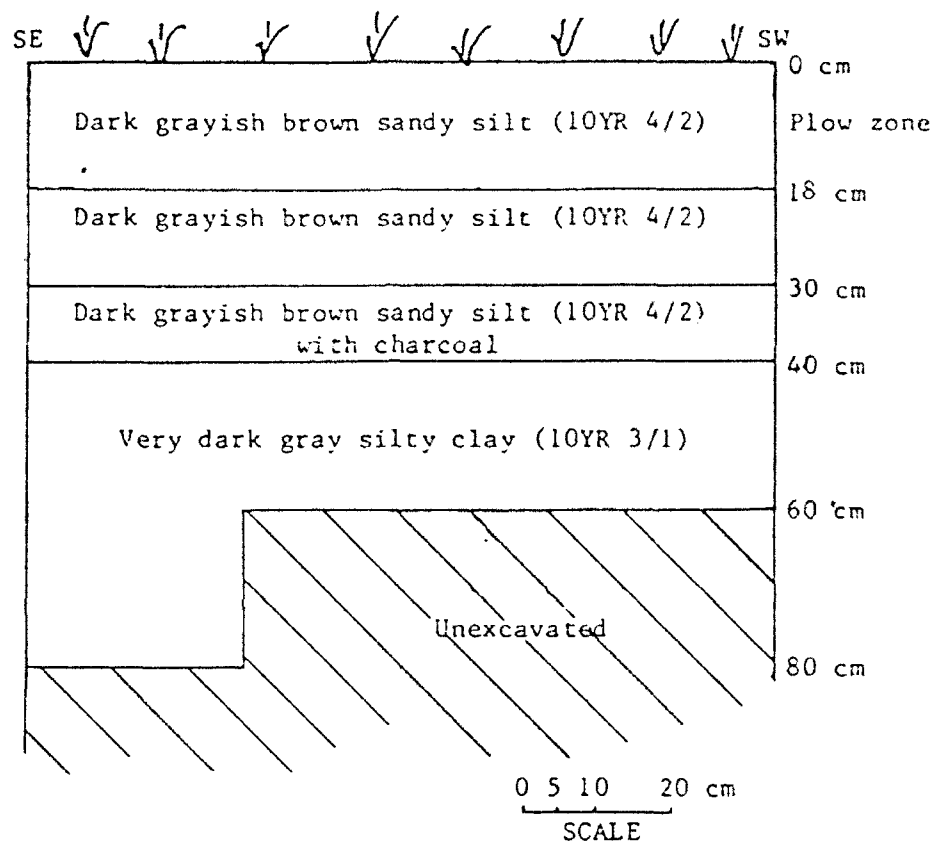


Figure B.4 South wall profile NLU-83-205

TABLE 8-1. Prehistoric Artifacts

	Gen. Coll.	LOT 1	LOT 2 0-18 cm. TU	LOT 3 18-30 cm. TU	LOT 4	LOT 5	LOT 6	LOT 7	LOT 8	LOT 9	LOT 10	LOT 11	LOT 12	LOT 13	LOT 14	LOT 15	LOT 16	LOT 17	LOT 18	LOT 19	LOT 20	LOT 21	LOT 22	LOT 23	LOT 24	LOT 25	LOT 26	LOT 27	LOT 28	LOT 29	LOT 30	LOT 31	LOT 32	LOT 33	LOT 34	LOT 35	LOT 36	LOT 37		
PREHISTORIC																																								
Decorated Ceramics																																								
Body Sherds																																								
Owens Punctated																																								
Parkin Punctated																																								
Wallace Incised																																								
Untyped, Incised, Cat. 1	1																																							
Untyped, Incised, Cat. 2	1																																							
Untyped, Punctated																																								
Untyped, Red Slipped	1																																							
Untyped, Ridged																																								
Rim Sherds																																								
Owens Punctated																																								
Untyped, Incised Rim	1																																							
Untyped, Lugged Rim	1																																							
Untyped, Notched Rim	1																																							
Body Sherds																																								
Untyped, Undecorated	2	4	23	17	8	14	8	11	7	9	24	21	20	26	8	7	17	38	27	7	16	7	10	10	29	13	19	1												
Rim Sherds																																								
Untyped, Undecorated rims																																								
Biface																																								
Core Fragment																																								
Flakes																																								
Groundstone																																								
Shatter																																								

TABLE B-1. Continued.

[illegible]

Prehistoric Artifacts

Prehistoric ceramics recovered from the site consist entirely of shell tempered types and have relatively tight range of colors. The exteriors of sherds range from light gray (10YR7/1) to very dark gray (10YR3/1), the interior ranges from light gray (10YR7/2) to very dark gray (10YR3/1) and the cores range from light gray (10YR7/2) to very dark gray (10YR3/1).

Of the 450 sherds collected, 39 are decorated in some manner while the remaining 411 are plain. Of the plain sherds 20 are undecorated rims. All the sherds are shell tempered. Of the decorated wares one body sherd (Figure B-5:a) appears to be a variety of Owens Punctated (Phillips 1970:149-150). These sherds appear to be from a vessel with an excurve rim with a flattened lip. The decorative elements consist of small circular punctations bordered by thin straight incised lines. Owens Punctated is of the Late Mississippian period and has a distribution through the southern part of the Lower Saint Francis Basin, the northern Yazoo Basin and the Arkansas Lowlands (Phillips 1970:150).

Another sherd appears to be a variety of Parkin Punctated (Figure B-5:b). This sherd is decorated with deep fingernail punctations. Parkin Punctated is described by Phillips (1970:150-152) as a Late Mississippian type. It has a wide distribution range occurring from the Louisiana-Arkansas state line to above Memphis (Phillips, Ford and Griffin 1951:113). This ceramic type is most common in the Lower Saint Francis River Basin and the northern part of the Yazoo Basin (Phillips 1970:149).

Two sherds (Figure B-5:c-d) appear to be similar to Wallace Incised ceramics. The design consists of zoned, deep trough-like diagonal incisions. These incisions are 0.3 centimeters wide, 0.1 centimeter deep and spaced 0.65 centimeter to 0.85 centimeter apart. Wallace Incised ceramics are classed as Terminal Mississippian to Historic and have a distribution in the area of the Arkansas River Lowland and Lower White River Basin (Phillips, Ford and Griffin 1951:135 and 168-169).

The remaining 29 decorated body sherds are all untyped. Of these, 18 are incised, seven punctated, three red slipped and one ridged. The incised sherds have been classified into two categories.

Untyped Incised, Category 1 (Figure B-5:e) consists of four sherds. These sherds exhibit unevenly spaced, shallow, curvilinear incisions. There are 12 Untyped Incised, Category 2 (Figure B-5:f-g) sherds. These all exhibit non-curvilinear incisions "U of V" shaped incisions that vary in width and depth. The seven Untyped Punctated sherds are variable. Some appear to be finger punctated while others have been punctated with a tool. There are three Red Slipped sherds. These are all slipped only on the exterior. One ridged sherd was collected. The ridges appear to have been finger pinched.

Six decorated rims were collected. One (Figure B-6:a) appears to be similar to Owens Punctated and is apparently from the same vessel as the other Owens Punctated sherd. This sherd is too small to be able to assign an orifice diameter to it. The rim is slightly incurvate and the lip is thinner.

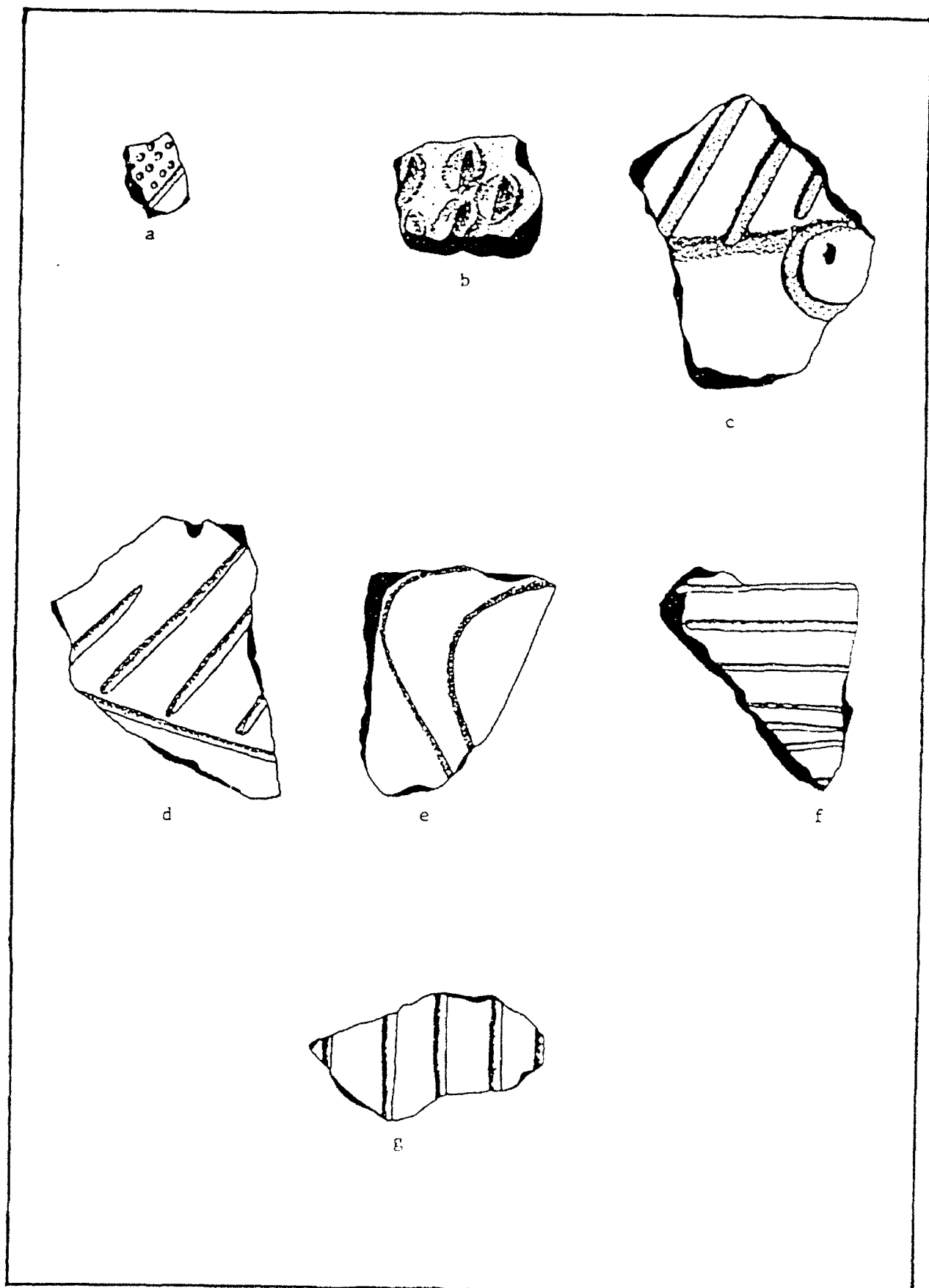


Figure B.5 Selected decorated sherds from 3DE18 (NLU-83-205)

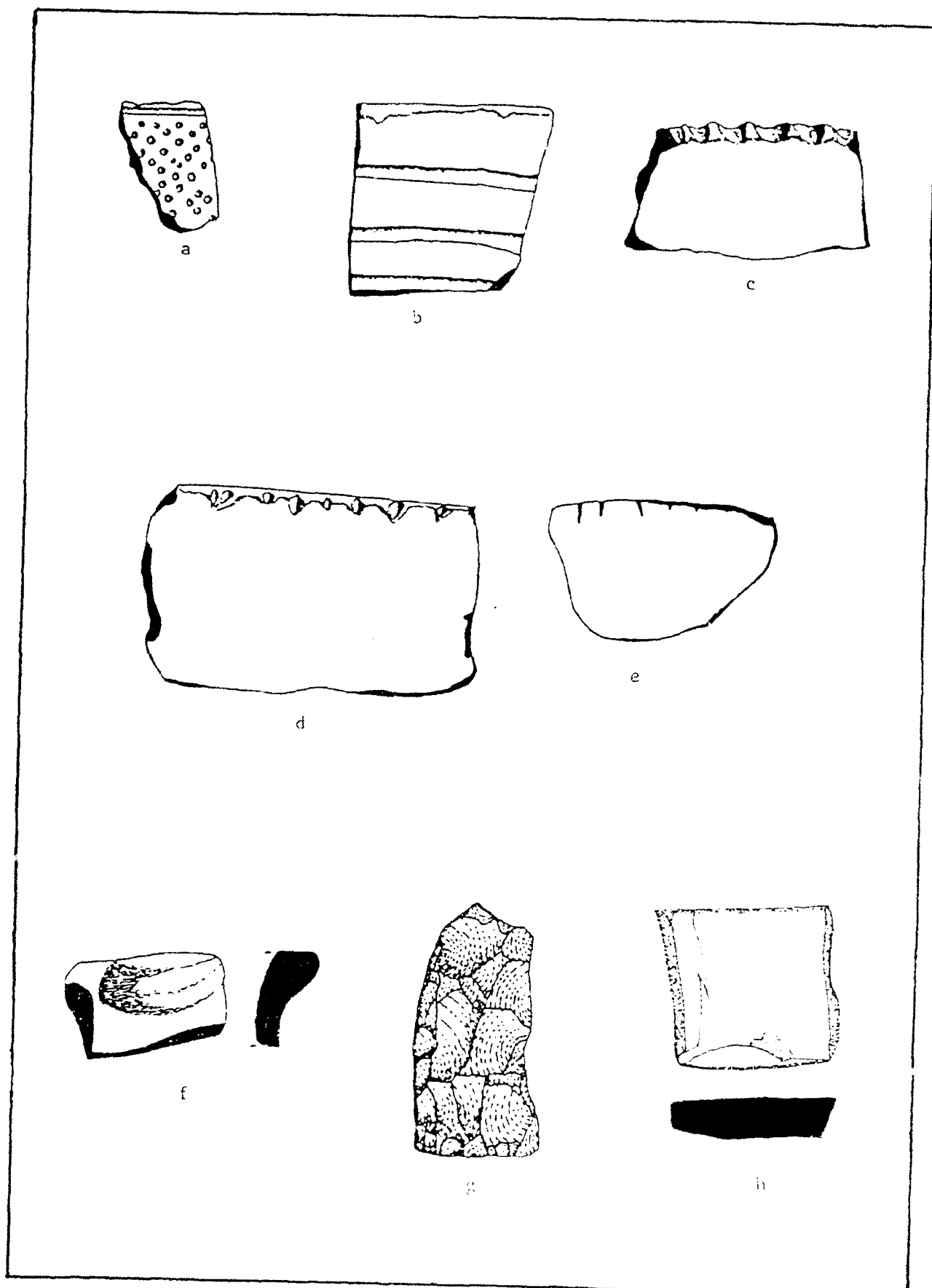


Figure B.6 Selected decorated rims and stone artifacts from 3DE18 (NLP-83-205)

The Incised Rim (Figure B-6:b) is slightly excurvate and expanding. The lip is square. The decorative element consists of 0.2 centimeters wide shallow horizontal trailings spaced 0.8 centimeters apart. The rim is 0.7 centimeter thick and the lip is 0.8 centimeter thick. The Untyped Lugged Rim is slightly excurvate and retains one semi-hemispherical lug. The lug is 2.2 centimeters wide and extends 0.9 centimeters from the vessel exterior. The top of the lug is flush with the vessel lip. Untyped Notched Rims consist of three specimens. All exhibit exterior lip notching. The first (Figure B-6:c) has an orifice diameter of 16 centimeters. The notches are 0.5 centimeter wide and spaced 0.1 centimeter apart. The displaced paste forms ridges between each notch. The rim is 0.6 centimeter thick. The second notched rim (Figure B-6:d) has a squared and thinned lip. The orifice diameter is 23 centimeters. The notches are 0.2 centimeter wide and 0.1 centimeter deep and 0.4 centimeter apart. The rim is 0.5 centimeter and the lip is 0.3 centimeter. The third rim (Figure B-6:e) is from either a small bowl or a bottle. The lip is pointed. The orifice diameter is 8 centimeters. The notches are 0.4 centimeter long, 0.1 centimeter wide, 0.05 centimeter deep and are spaced 0.4 centimeter apart. The rim is 0.4 centimeter thick and the lip is 0.15 centimeter thick.

Of the 20 undecorated rims, eight are straight to excurvate with squared lips. All have thinned lips 0.2 centimeter to 0.4 centimeter thick and rims 0.4 centimeter to 0.85 centimeter thick. Eleven are straight to excurvate rims with rounded lips. All of the latter have thinned lips 0.2 to 0.6 centimeter and rims 0.5 to 0.65 centimeter. One rim is flared exhibiting an almost 90° angle curve. The lip is 0.2 centimeter and the rim is 0.4 centimeter thick.

The remaining 411 sherds are all undecorated shell tempered body sherds. They range in thickness from 0.25 centimeter to 1.4 centimeters.

All the sherds collected appear to fit the ceramic types associated with the Late Mississippian period.

The lithic assemblage recovered from the site is composed entirely of chert. Much of the material appears to be heat treated with a resulting distortion of color. Of the 57 pieces collected all but 13 retain cortex. Thirty-six of the artifacts were made from various brown chert, nine were made of gray chert, two were made of purple chert, two were made of red chert, six were made of white chert and two were made of brownish-yellow chert. Included in this collection were one biface, one groundstone tool fragment, four core fragments, 46 flakes and five pieces of shatter.

The biface fragment (Figure B-6:g) was made from a coarse brown chert. It had been broken transversally across the blade. The width was 2.5 centimeters and the thickness 1.7 centimeters. It was plano-convex in cross-section and the cortex was retained on one surface. The groundstone tool fragment (Figure B-6:h) is also made from a coarse brown chert. It appears to be the medial portion of a celt or gouge. Polishing resulting from wear occurs on one end. The tool is rectangular in cross section and measures 3 centimeters long, 2.9 centimeters wide and 0.85 centimeter thick. The four core fragments average 3.5 x 2.0 x 1.8 centimeters in size. They are all river cobbles. Forty-six flakes were recovered from the site. Most retained cortex. The flakes ranged from 0.7 x 0.7 x 0.05 centimeter to 3.7 x 3.1 x 0.35 centimeters in size. The five pieces of shatter averaged 3.7 x 2.3 x 1.4 centimeters in size.

Historic Artifacts

Thirty-nine brick fragments were recovered from the site and are too small to determine original brick size. The paste varies from soft friable to hard. Colors range from yellowish-red (5YR5/6), red (2.5YR5/6) to reddish-brown (2.5YR4/4).

Historic ceramics collected from the site consist of stoneware and white-ware. There were a total 11 pieces of historic ceramics collected. Three pieces of stoneware were collected. Of these, one sherd is 0.55 centimeter thick, has a cream exterior and a very dusky red interior. A second, 0.6 centimeter thick, has a very dusky red interior and exterior. A third, 0.9 centimeter thick, is a basal edge sherd from a crock or jug. It is gray (5YR5/1) in color. Three pieces of annular ware were collected. The first sherd is a ribbed white and yellow sherd. The ribs are white. The interior is the same shade of yellow. Each rib is 0.35 centimeter wide, as is the spacing between each rib. The sherd is 0.3 centimeter thick with the ribs adding 0.05 centimeter. Two specimens of the second type have a yellow exterior and interior with thin blue bands on the exterior. The bands are 0.4 centimeter wide. Whiteware collected consists of two rims, a plate base and two body sherds. One rim has a blue band on its lip. The exterior is exfoliated. The second rim is white and is probably from a cup. The lip is rounded and is 0.4 centimeter thick. The surface of this sherd shows crackling. The plate base is white both exterior and interior and exhibits crackling. It is 0.7 centimeter thick. The two body sherds both exhibit crackling of the surface. One is exfoliated on one side. The other is 0.5 centimeter thick.

The aqua blue glass fragments range from 0.2 centimeter to 0.7 centimeter in thickness and are for the most part too small to determine function. Three, however, appear to be from canning jars. The four aqua green glass fragments range in thickness from 0.2 to 0.4 centimeter. Two of the fragments are from canning jars. The others are flat and are of undetermined function. The three brown glass fragments are from bottles. These fragments range from 0.25 to 0.4 centimeter. Most of the 34 clear glass fragments appear to be window glass. The average thickness of these is 0.2 centimeter. Six of the fragments appear to be from containers. Three of these range in thickness from 0.1 to 0.4 centimeters. One fragment is a basal fragment of a bottle of undetermined size. This fragment retains no maker's mark. Another clear glass fragment is part of a screw top of a canning jar. One green glass fragment, 0.5 centimeter thick, appears to have been from a bottle. Two pieces of purple glass were collected. These occur as a result of the sun's action on clear glass manufactured between 1830 and 1915 (Munsey 1970:55).

The aluminum artifact is a pull tab from a presentday beverage can. The iron consists of three drawn wire nails, three fencing staples, a fragment of barbed wire and three undiagnostic fragments. The rubber is a piece of red hydraulic hose. It is 8.0 centimeters in length and 1.3 centimeters wide with a 0.6 centimeter wide orifice.

One hundred four bones, bone fragments and teeth were recovered from the site. One bird bone fragment was recovered. It appears to be from a large bird. One deer tooth and the end of a juvenile deer long bone were recovered. Fish bone is represented by three vertebrae. Although it is probable many of

the unidentified bone fragments are human bone, only four teeth have been absolutely identified as human. One of the teeth is a premolar and three are molars.

The six large mammal bone fragments are long bone fragments that are not complete enough to determine species. There are also six small mammal bones. Of these, one is a complete bone that has not been identified as to species. The others are fragmentary. The 12 turtle bones include shell fragments and leg bones. The 70 unidentified bone fragments are specimens that are burned, broken and devoid of distinguishing characteristics. Three small fragments of coal were also recovered.

One hundred sixty-nine fragments of daub or fired clay were recovered from the site. Many of the recovered specimens exhibit glass or reed impressions. The fragments range in size from spherical shapes approximately 0.3 centimeter in diameter to one piece which is 6.0 x 4.6 x 1/3 centimeters in size. Whether these are from prehistoric structures or the result of forest clearing is unclear.

Site Size, Distribution and Interpretation Based on Investigations

The site covers approximately 65,000² meters (200 x 325 meters; 600 x 1,066 feet). Subsurface material extends at least 1.4 meters (4.5 feet) below the ground surface in some portions of the site (Luther Miller 1983:personal communication). During the investigations subsurface cultural material was found at a depth of 30 centimeters below the surface (test unit 2). Because of interrupted testing due to defoliant spraying, this test unit was not completed and the actual depth of cultural materials at that location on the site was not determined. At other locations material was found only in the upper 20 centimeters. The site has been cultivated and the southern portion levelled (Figure B-3). However, the integrity of the site still remains as it appears that there are extensive undisturbed subsurface deposits (Luther Miller 1983:personal communication).

The prehistoric component represents the remains of a Late Mississippian mound, village and cemetery. On the basis of the artifacts (i.e. shell tempered ceramics) recovered it would appear that this site is late, perhaps even of the contact period (A.D. 1450 - A.D. 1660).

Luther Miller (1983:personal communication) reports that he hit something that felt like glass with his probe while collecting from the site. If this is the case it may indeed be evidence of contact between the Mississippian peoples inhabiting this site and Europeans. The site is reported to have rectangular stains that are visible when the area lies fallow. These may be the remnants of middens or even structures. Burials have been located not only in the plow zone where they have been destroyed by agricultural activity, but also at least 1.4 meters (4.5 feet) deep. Luther Miller (1983:personal communication) reports that he has dug burials as deep as 1.4 meters (4.5 feet). For the first few years after the site was cleared and plowing begun it was common for burials to be brought up. The farm hands would then decorate their tractors with the skulls. Today only broken fragments of these former burials are to be seen. The southern portion of the site belonging to Brooks Griffin was levelled in 1982. However, subsurface material is still extant and Miller found a small jar about 10 centimeters below the surface in

this area (Figure C.4; 1983:personal communication). Based on the appearance of a structure at this location on the 1930 U.S. Army Corps of Engineers 15' Mellwood quadrangle but not one on the 1882 Mississippi River Commission Maps, it would appear that the historic component dates to at least 1930 but not before 1882. This is also confirmed by the finding of purple glass on the site. Purple glass is a time marker having been manufactured between 1880 and 1915 (Munsey 1970:55). The small quantity of this material found and the other types of historic cultural materials would argue for a date closer to 1930 than 1882. It is also reported that the mound portion of the site was used as an historic cemetery. Reportedly both blacks and whites are buried here (Philip Gattis; Luther Miller; Pat Thompson 1983:personal communication). If this is the case, intrusive historic materials may be found at depth. Reportedly some of the burials plowed up wore fabric type clothing. These would certainly be from the historic period (Luther Miller 1983:personal communication).

NLU-83-206

Location and Physical Setting

This site (Figure B-7) occupies level alluvial floodplain deposits at an elevation of approximately 48.87 meters (160 feet) AMSL. The site is bounded by roads on the north, east and west. The soil is Commerce silt loam (Gill et al 1972). The site lies in a plowed field on the edge of the land side berm of the present levee. At the time of the survey, the field was planted in soybeans.

Site History

The 1882 Mississippi River Commission Maps do not depict any structures at this location. The area was being cultivated, and the crop produced was cotton. No owner is indicated.

The earliest available map depicting a structure at this location is the 1954 U.S. Army Corps of Engineers 15' Mellwood topographic quadrangle. No structure is depicted on the site area in any of the earlier versions (1930, 1936 and 1939) of this quadrangle.

Methodology

The site was initially observed during the on-the-ground survey. At that time a light density surface scatter of historic household debris was observed. Shovel tests were excavated at 30 x 30 x 50 centimeter intervals north and south across the site. No subsurface cultural material or features were encountered.

The site location was plotted on project maps and flagged for return investigations. When revisited, the surface site limits were determined and marked with flagged poles. The site limits as manifested on the surface were then ampped with a transit and stadia rod. Three 2 x 3 meter controlled surface collection units were placed at random over the known site area. The southeast corner of each surface unit was mapped and all material on the surface within the units was then systematically collected and bagged separately.

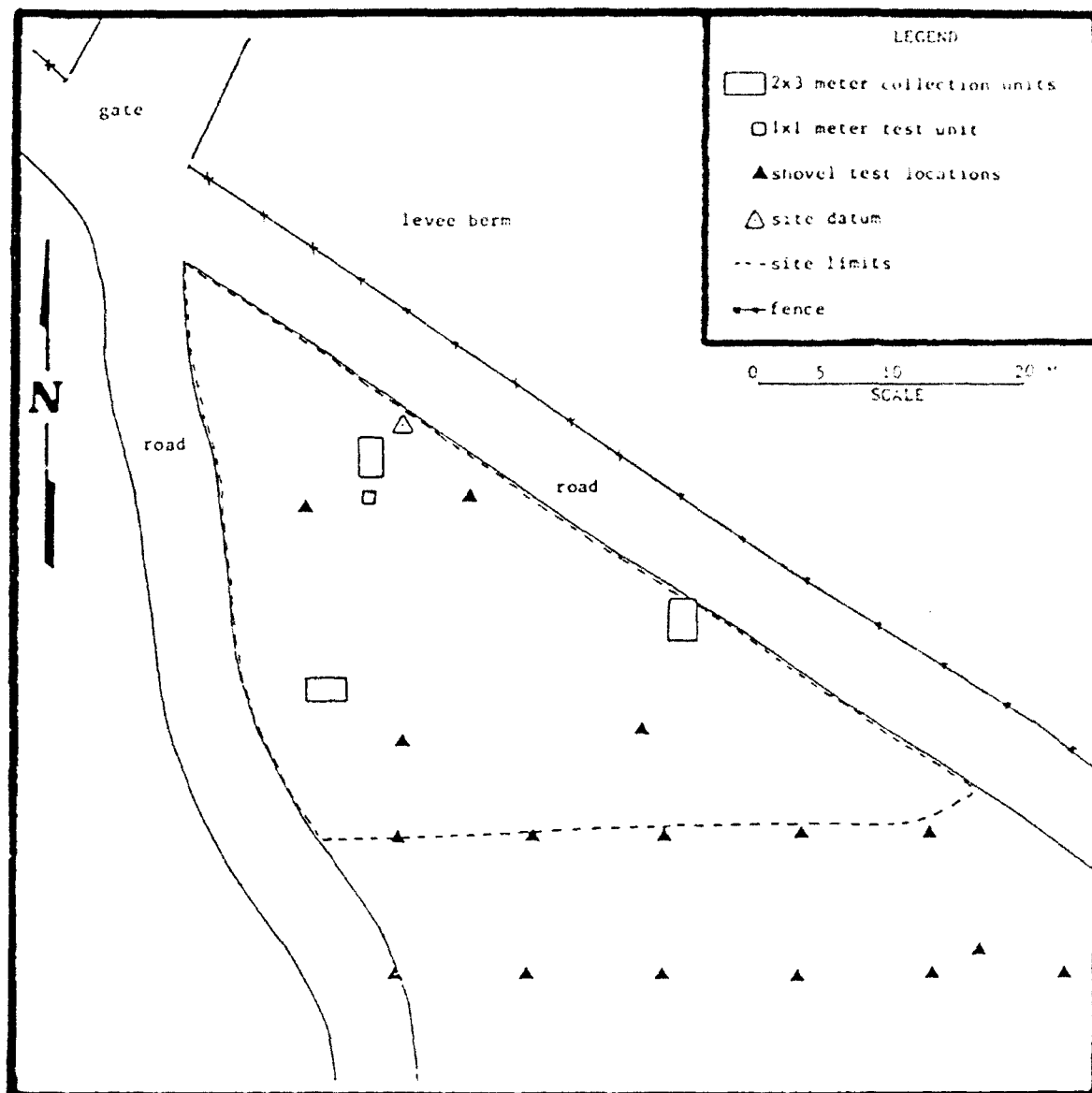


Figure B.7 Site map NLU-83-206

Recall, subsurface shovel tests excavated during the survey phase were negative in that no cultural material was encountered. Therefore, the location of the 1 x 1 meter excavation unit was located arbitrarily in the vicinity of the household debris scatter. The excavation unit was staked out and the southeast corner mapped. The unit was excavated in natural and 10 centimeter stratigraphic levels. The matrix from each level was passed through a 1/4 inch steel mesh shaker screen. All cultural material encountered was then bagged by stratigraphic level.

Two lines of 30 x 30 x 50 centimeters shovel tests, oriented east-west, were also excavated along the southern edge of the site. The first was along the southern edge of the surface scatter. The second was 10 meters south of the first line. The shovel tests were spaced at 10 meter intervals. These were excavated to insure that the surface scatter represented the limits of the site. No subsurface cultural material was encountered.

Stratigraphy

The south wall profile of the test unit is depicted in Figure B-8. The profile observed is described below.

1 x 1 Meter Test Unit:

- 0-17 cm: plow zone - dark brown (10YR3/3) silty clay with a moderate amount of cultural material throughout;
- 17-37 cm: dark brown (10YR4/3) silty clay, no cultural material;
- 37-60 cm: dark brown (10YR3/3) silty clay, no cultural material.

Artifacts

The following artifacts collected from the site are listed in Table B-2 and discussed below.

The brick fragments are all too small to determine the original sizes of the bricks. The paste is hard and the color is reddish-brown (2.5YR4/4).

The porcelain object is from an electrical fitting. It is cylindrical in shape, 5.6 centimeters in diameter and 1.95 centimeters in thickness. The exterior surface is embossed "HEMCO, MADE IN USA" and "G-5614". The interior is embossed "H" and "UL". This sort of fitting is still in use and dates from the middle part of the 20th century.

The stoneware sherd is 0.6 centimeter thick. The exterior and interior glaze is black in color (5YR2.5/1). The paste is very pale brown in color (10YR8/3). This sherd is not temporally discrete. However, the use of interior glaze, at least on jugs, generally dates to the 20th century (Munsey 1970:140).

The three whiteware sherds appear to be from plates. Two are rim fragments. One is 0.5 centimeter thick and has a diameter of 23 centimeters. The second has a thinned rim and spaced embossed indentions on the lip. The body is 0.55 centimeter thick and the lip is 0.3 centimeter thick. The indentations are 1.1 centimetres wide, 0.15 centimeter deep. Not enough of the rim is retained to determine the spacing of the indentations. Although not

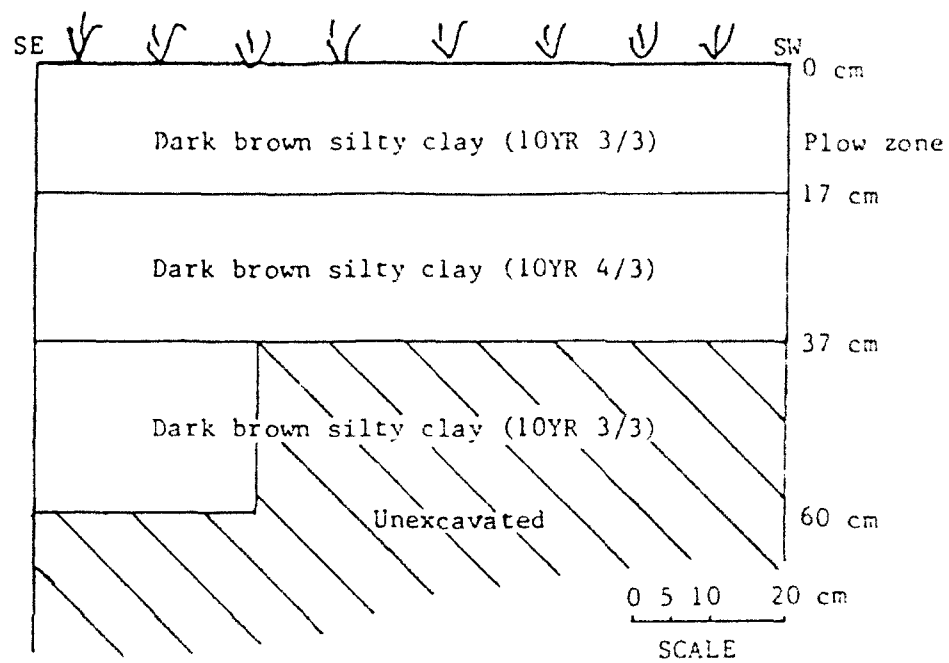


Figure B.8 South wall profile NLU-83-206

discretely datable, embossed wares were popular in the late 19th century (Price 1979). This sherd may represent a keepsake from that period.


TABLE B-2. Artifacts, NLU-83-206

	Gen. Sur.	TEST UNIT 1-SURFACE 0-5cm	TEST UNIT 1-PLOW ZN. 5-17cm	COLLECTION UNIT 1	COLLECTION UNIT 2	COLLECTION UNIT 3	TOTAL
Ceramics							
Brick fragment		1		2			3
Porcelain	1						1
Stoneware						1	1
Whiteware	2					1	3
Glass							
Aqua green					1		1
Amber	1	1	1		1	1	5
Blue						1	1
Clear	2	2	5	3	10	7	29
Ruby red						1	1
Green milk		1				1	2
White milk	2	1		4	2	2	11
Miscellaneous							
Metal							
Aluminum						1	1
Iron			6				6
Other							
Bone						1	1
Nylon fabric				1			1
Plastic	1		2	3	5	1	12
Rubber					1		1
TOTAL	9	6	14	13	20	18	80

The aqua green glass sherd is an undiagnostic basal edge of a bottle; most likely a Coco-Cola bottle. This could date to most of the 20th century.

The amber glass sherd consists of a molded neck fragment from a bottle. The sherd is too fragmentary to determine the orifice diameter. The mold seam continues to the top of the sherd. The number "48" appears on the fragment which may indicate it was a 48 ounce bottle. Four other small amber specimens are undiagnostic fragments. None of these sherds could be dated.

The blue glass sherd, less than 0.2 centimeter in thickness, is probably from a Phillips Milk of Magnesia bottle. It has no diagnostic features. This sherd could date to almost any period of the 20th century.

Three of the clear glass sherds are basal fragments from bottles. One, a sherd from collection unit 2, is from a small rectangular bottle, possibly a medicine bottle, and is embossed with "G  3". According to Toulouse (1971:553), this symbol is of unknown origin. Another base from collection

unit 2 is from a half pint flask. The words "HALF PINT" are embossed just above the base seam. The base includes the partial embossment "51 57". No further identification can be noted. The final clear glass base, from collection unit 3, is from a small rectangular bottle. The base is embossed with a "J" 55". The "J" within the keystone is the trademark of the Knox Glass Bottle Co. of Jackson, Mississippi. It was made sometime between 1932 to 1953 (Toulouse 1971:271).

The remaining clear glass fragments consist of three decorated with embossed stippling; two ribbed fragments, possibly from refrigerator bottles; a fragment with a portion of a red painted label, possibly from a Pepsi bottle; a crown neck fragment; a lip fragment from a screw top jar; a mirror fragment; and 17 undiagnostic fragments ranging in thickness from 0.15 to 0.6 centimeter.

One small ruby red glass sherd has a very faint stippled pattern embossed on its exterior. This sherd cannot be dated but undoubtedly came from a prized container. Red glass is rare as it takes one ounce of gold to create 60 pounds of ruby-red glass (Munsey 1970:37).

Two green milk glass fragments are probably from cups. Both are undiagnostic, one being a basal fragment and the other a body sherd.

Eleven white milk glass sherds were also recovered. Two from the general surface collection are probably from cups. They do not include any diagnostic features, but these two sherds exhibit considerably less surface deterioration than the remaining sherds in the collection. The sherd from test unit 1 has an eroded surface. It is from either a cup, bowl or a jar. Four sherds from collection unit 1 are from a plate or shallow bowl. These sherds have a ribbed pattern and there was a gold line edging the rim. The plate was 17.0 centimeters in diameter. The ribs are 0.85 centimeter wide and spaced 0.3 centimeter apart. A sherd from collection unit 2 is the base of a coffee cup. It includes the partial embossing "____OCKING". The legend is almost certainly that used by the Anchor Hocking Glass Corp. of Lancaster, Ohio and was made after 1938 (Toulouse 1971:48). The other fragment from collection unit 2 is probably from a plate. The two fragments from collection unit 3 are probably from a cup or jar. One includes the partial embossment "FOO" in script, "W____" and "MA____". None of these marks could be identified. The other sherd is an undiagnostic basal sherd.

A small piece of shaped aluminum was recovered from collection unit 3. The function of this fragment could not be ascertained.

Six fragments of iron were recovered from test unit 1. These include one drawn wire nail shaft, a twist key from a can and four miscellaneous fragments from cans.

The bone fragment collected from collection unit 3 is a portion of a long bone that had been sawed. It undoubtedly represents the remains of a steak.

One piece of blue nylon fabric with a raised white stripe was recovered. No function can be assigned to this piece of material.

Twelve pieces of plastic were recovered from the site. Four of these are light green and evidently from the same object. All of these pieces exhibit signs of melting. Four pieces are white; one of these is a bottle neck and shoulder, another is a small moulded tab and the final two are undiagnostic as to function. Only the bottle neck exhibits melting. There is one piece of what appears to be dark green tape. An aqua piece exhibits melting but is undiagnostic. The final pieces are one tan piece of undetermined function and three pieces of a lid or base. The latter are gray with gold specks. The presence of plastic would indicate a date at this site of the mid to late 20th century.

One rubber tire fragment was found. This fragment included some of the tread and sidewall but no diagnostic marks were found.

Site Size, Distribution and Interpretation Based on Investigations

As a result of investigations it is concluded that the areal limits of the surface scatter were approximately 50 x 30 meters at its widest point. The site lies between two roads in the shape of an obtuse triangle and the total area included in the site limits is approximately 1,125 meters. The subsurface stratigraphy indicates that there is no intact component at the site. This is based on the initial shovel testing and the subsequent excavations of further shovel tests and a 1 x 1 meter test unit.

Some artifacts from the 1 x 1 meter test unit all appear to have been subjected to heat. This may represent a trash burning area. No charcoal deposits indicating the destruction of the site by fire were found.

The entire site is believed to have been destroyed by razing of the structures and subsequent intensive agricultural activities.

Diagnostic artifacts appear, on the whole, to post-date World War II. This date would be corroborated by the first appearance of structures at this site on the 1954 U.S. Army topographic quadrangle for the area.

NLU-83-207

Location and Physical Setting

This site, an historic cemetery, is located approximately 38 meters (125 feet) landside of the top river bank of the Mississippi River. The elevation of the site is approximately 48.77 meters (160 feet) AMSL. Undisturbed soils in the area belong to the Sharkey-Commerce-Coushatta association (Gill et al 1972). Presently most of the area has been heavily disturbed by borrowing and bulldozing activities.

Site History

Comparison of the plotted location of this cemetery from quadrangle map to the Mississippi River Commission Map of 1882 shows that this is the location of the Knowlton Community Church and Cemetery.

According to the records of the General Land Office, the northwest quarter of section 8, T7S, R2E, was originally claimed by Abel Knowlton, Jr. on July

5, 1834. He patented this tract on December 1, 1839. It is on this quarter section that the Knowlton Church and Cemetery were located in 1882.

The church and cemetery were located on the western edge of Knowlton community in 1882 (Figure 4-3). On the 1882 Mississippi River Commission Map, the cemetery is 670 meters (2,200 feet) west of the Mississippi River bank. The present survey places it 27 meters (88.6 feet) from the land side of the revetment. This indicates a 643 meter (2,109.6 feet) wide loss of land in the area since 1882. Progressive erosion of the river bank can be seen by comparing the 1882 Mississippi River Commission Map to the 1930, 1936, 1939, 1954 and 1962 U.S. Army Corps of Engineers 15' Mellwood, Arkansas-Mississippi quadrangle.

Methodology

The survey team was informed of the presence of an historic cemetery in this area by Roy Sanderlin of Mosby, Arkansas. The site was not initially located during an intensive survey of the area. The area was revisited with the assistance of Philip Gattis of Mosby, Arkansas. After an intensive survey, the remains of one tombstone and a portion of a wrought iron fence were located. No other cultural remains were located. The location of the tombstone was mapped. Permanent datums were established. These are navigation tower 618 on the Mississippi River and a large tree with a nail driven into it. As this was the site of an historic cemetery no shovel tests were dug and no further work was done.

Site Size, Distribution and Interpretation Based on Investigations

Remains of this cemetery were restricted to one broken, marble tombstone and a twisted section of wrought iron fence. The area was heavily disturbed and original site size could not be determined. Measurements taken from the 1882 Mississippi River Commission Maps indicate that the cemetery was 91.44 meters east-west x 152.4 meters north-south (300 x 500 feet). Of this, only the western edge of a strip approximately 23 x 30 meters (75 to 100 feet) remains. Most of this has been destroyed by revetment work and a local road. The church site has been completely eroded by the river and the grave located is probably on the very western edge of the cemetery. Only 1897, the year of death, could be made out on the tombstone. The fence remains were not associated with any graves and had been completely warped and twisted by the river's action when it overflowed. No other cultural remains were found although there may be a few more unmarked graves in the vicinity.

NLU-83-209

Location and Physical Setting

This site is located in an old borrow pit. The elevation of the site is 47.24 meters (155 feet) AMSL. The soils belong to the Sharkey-Commerce-Coushatta association (Gill et al 1972). At the time of the survey the area was in pasture.

Site History

This site is an active trash dump. The dump is within a borrow pit which was dug during the construction of the modern levee which was built between 1936 and 1939 (U.S. Army Corps of Engineers 15' Mellwood quadrangles, 1936 and 1939).

Methodology

The site was located during the on-the-ground survey of the area. The location was flagged and marked on large scale aerial blue-line maps for return investigation. When revisited, it was determined that no material predated the 1960's. The site was mapped and a permanent datum established (Navigation Tower 618). No shovel testing was done.

Artifacts

The contents of the dump include automobiles, pick-up trucks, household appliances and other refuse. Second class mail found in some of the piles are post-marked September 1983 and were addressed to individuals living in the local area. The oldest datable object noted was an automobile built in the mid-1960's.

Site Size, Distribution and Interpretation Based on Investigations

The site area is approximately 100 x 75 meters (328 x 246 feet). It is obviously a modern local trash dump of no great antiquity. Materials noted would place it beginning in the early 1960's.

APPENDIX B

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APPENDIX C

LUTHER MILLER COLLECTION FROM 3DE18

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APPENDIX C

LUTHER MILLER COLLECTION FROM 3DE18

The artifacts described in this appendix are from the collection of Luther Miller of Mellwood, Arkansas and were collected from 3DE18 (NLU-83-205).

Vessel 1 (Figure C-1:a and b) is a large "gourd" (pentagonal) shaped bottle with a rounded base. The vessel is shell tempered, light tan in color and lightly polished.

The bottle is 29 centimeters tall with the neck being 9 centimeters in height. The body of the bottle is 36 centimeters in diameter at its greatest point. Indentations between the five large rounded nodes are 2 centimeters deep. The neck is 10.5 centimeters in diameter at its base. It was apparently made separately and then joined to the body as there is a join line evident at the neck base. The rim of the vessel is expanding and is 5.5 centimeters in diameter at the mouth of the bottle. Rim thickness is 0.5 centimeters.

Vessel 2 (Figure C-2:a) is a jar on an elevated perforated base. The vessel is shell tempered, light tan in color and well polished. The height of the vessel is 19 centimeters and its is 34.5 centimeters in diameter at the base. The rim is expanding with a 17.0 centimeter orifice. Rim thickness is 0.3 centimeters. The neck of the vessel is 30 centimeters in diameter. From rim to shoulder the jar is 5 centimeters, from shoulder to top of perforated base 10 centimeters, and the base is 4 centimeters tall. The base is an inverted truncated cone with 19 vertical rows of holes, three holes high all aligned. The base appears to have been made with the pot as no join line is visible.

Vessel 3 (Figure C-2:b) is a bottle with a broken neck. It is shell tempered and light tan in color with a rounded base. Height is 14 centimeters from the base of the neck to the rounded base. The body is 19 centimeters in diameter and the base of the neck 13 centimeters in diameter. Thickness of the wall is 0.4 centimeters. The neck of the bottle appears to have been made separated and then joined to the body. Reportedly the neck of the vessel, which has not yet been restored, was approximately 6 centimeters high (Luther Miller 1983:personal No other description of the neck has been given.

Besides the above three ceramic vessels the following lithic artifacts are reported having been collected from 3DE18 (NLU-83-205).

The first is a flaked and polished celt (Figure C-3:a). It is made from grayish-brown petrified wood and is 7.5 centimeters long, 4.5 centimeters wide at the proximal end, 2.5 centimeters wide at the distal end and 3.5 centimeters wide at the center. It is 1.0 centimeters thick. The second artifact is a flaked river cobble that may have been used as an adze or celt (Figure C-3:b). This artifact is made from a light brown chert and still retains cortex over most of its surface. the artifact is 5.5 centimeters long, 4.0 centimeters thick at the distal end, 4.5 centimeters thick at the proximal end and 1.5 centimeters thick. Only the proximal end is worked. The third artifact is also made from a river cobble. It appears to be a flaked adze or celt

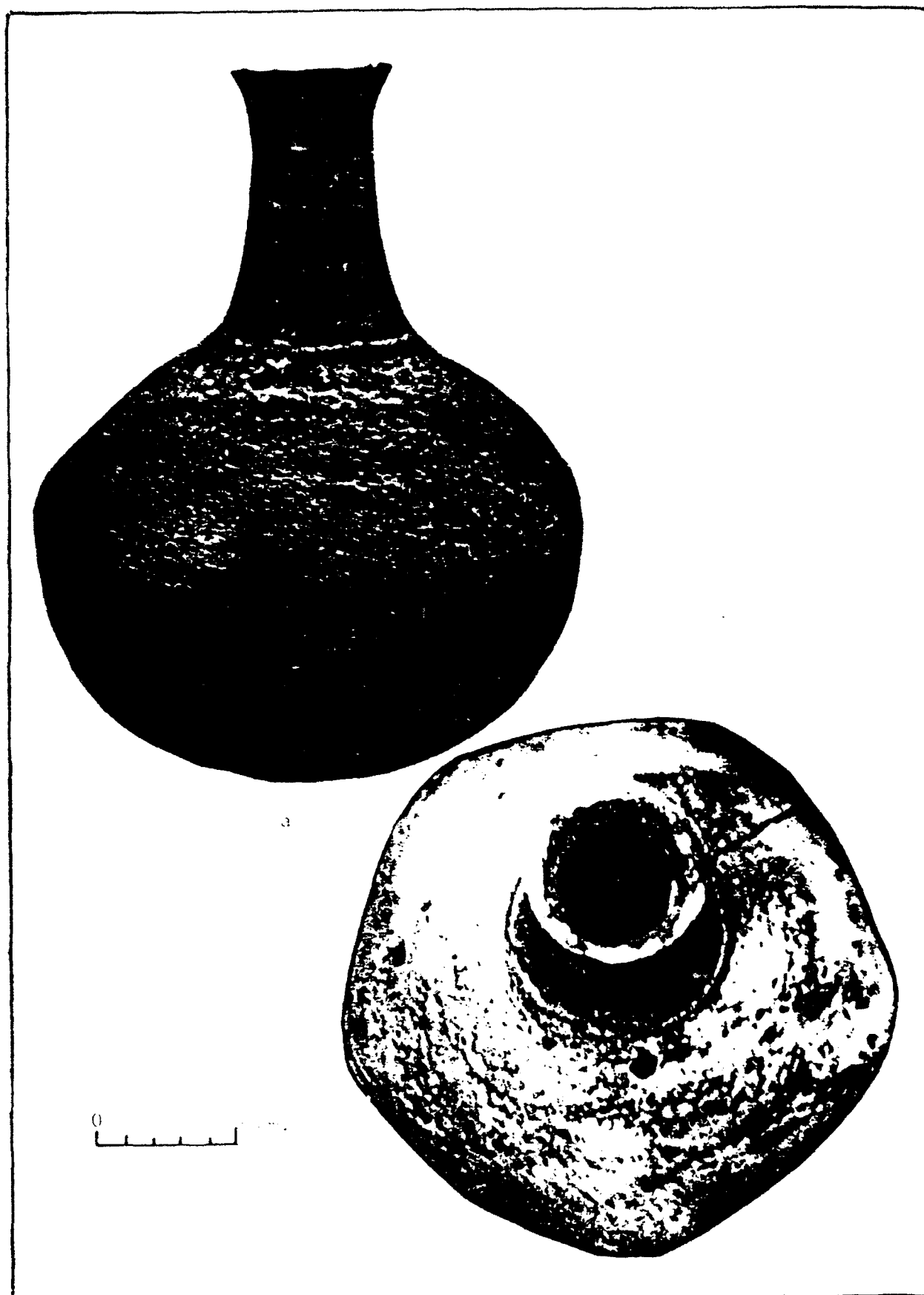


Figure C.1 Large North American pottery jar at Luther Miller, excavated from
MPPS, 1911-1912.

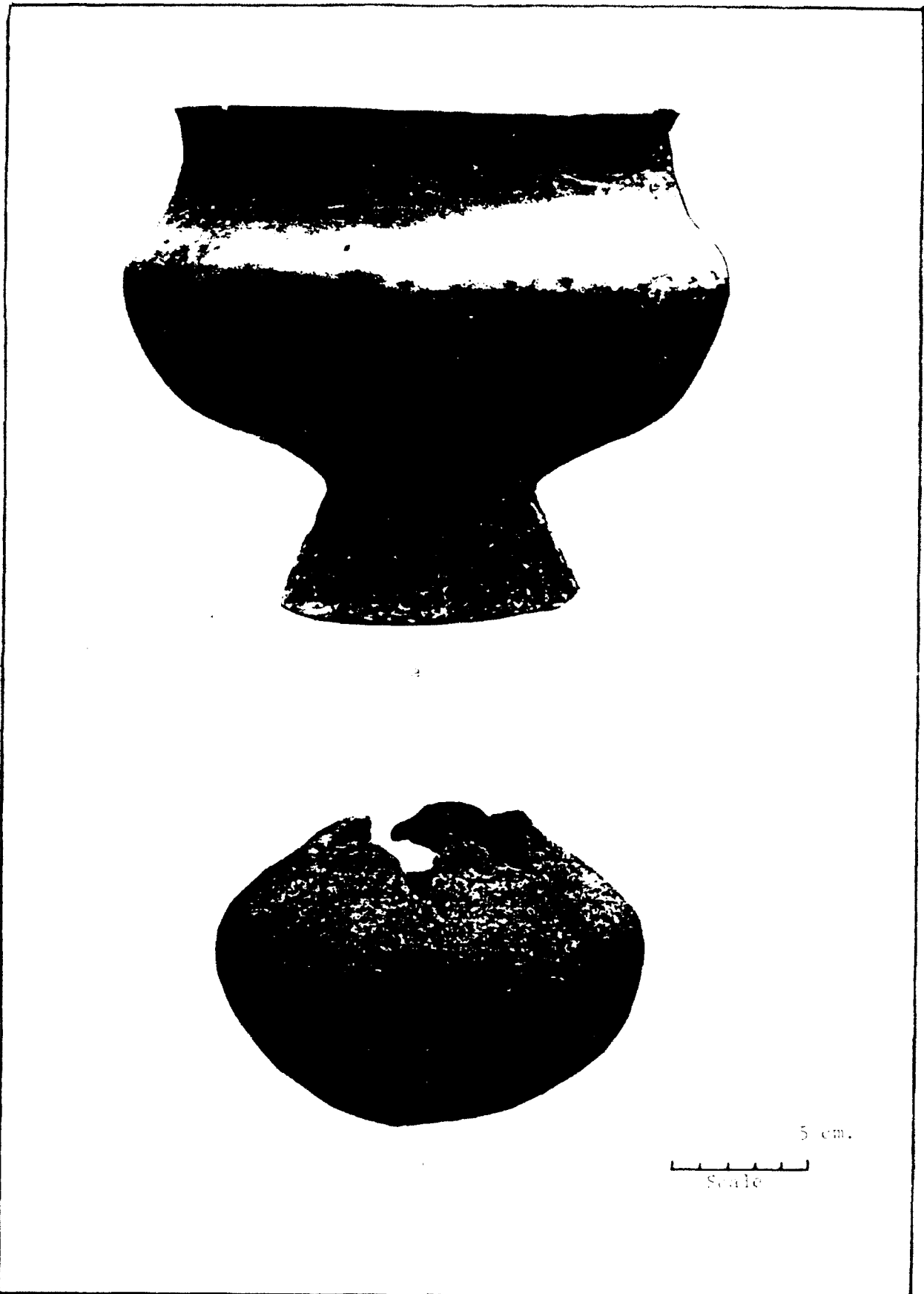


Figure C.2 Jar and small bottle, from the site of Miller, excavated from 3DE18 (NUC-83-20)

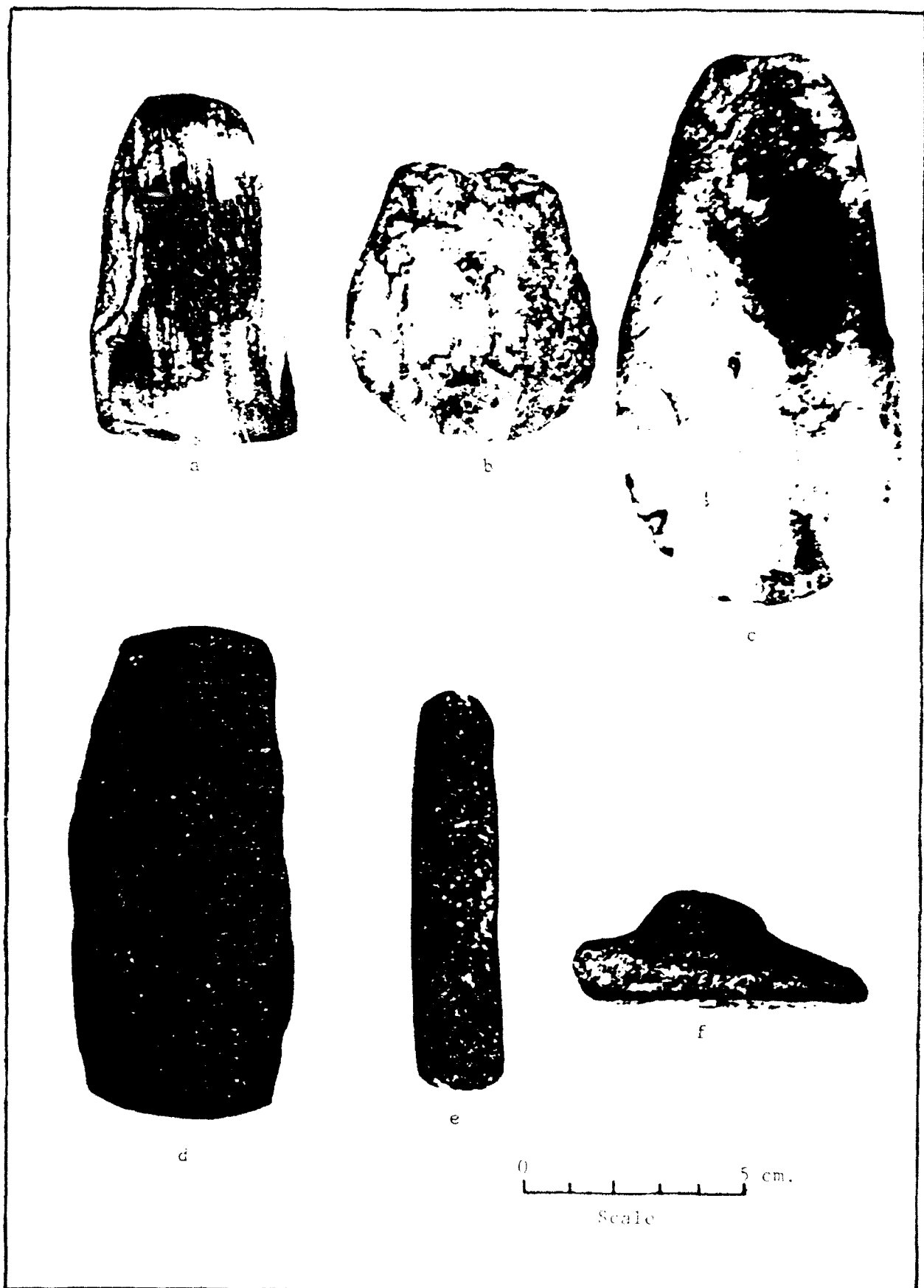


Figure C.3 Stone artifacts from collection of Luther Miller, collected from 3DE18 (NIP-11-205)

(Figure C-3:c). It is made from a light cream colored chert cobbles. It is 11.5 centimeters in length, 3.5 centimeters wide at the distal end, 6.5 centimeters at the proximal end and 1.5 centimeters thick. The proximal end is the only worked edge. The remaining area of the cobble retains the cortex. The fourth specimen is a polished and ground celt of black porphyry (Figure C-3:d). It shows some chipping along one longitudinal side. This tool is 10 centimeters in length, 3.5 centimeters wide at the distal end, 4.5 centimeters wide at the proximal end and 1.7 centimeters thick.

The fifth tool is a polished and ground chert chisel (Figure C-3:e). It is made of reddish-brown chert and is 8 centimeters long, 1.4 centimeters wide at the distal end, 2 centimeters wide at the proximal end and 1.7 centimeters thick. The sixth item is a reddish quartzite river cobble that has been shaped by grinding to produce a "knob in a base" (Figure C-3:f). This item is 6.3 centimeters long and approximately 2.8 centimeters tall. The knob is raised 1.3 centimeters from the base. No function is assigned to this piece.

APPENDIX D
PERSONS CONSULTED

APPENDIX D
PERSONS CONSULTED

DATE	PERSON/ADDRESS	SUBJECT
9-27-83	Dr. Leslie C. Stewart-Abernathy Pine Bluff, AR	Discussed historical occurrences in the Knowlton area with Arkansas Archeological Survey historical archeologist
9-27-83	Roy Sanderlin Mosby, AR	Got permission to survey land. Was told about a historic cemetery on riverside and a prehistoric mound on the landside
9-28-83	Brooks Griffin Mellwood, AR	Got permission to survey his land
10-1-83	Blacky Moore Elain, AR	Gave crew some names of old residents in the general area
10-2-83	Phillip Gattis Mosby, AR	Located historic cemetery on the ground. Gave information about mound site and local collections
10-3-83	Pat Thompson Crumrod, AR	Gave information about mound site and cemetery. Reported black burials on mound.
10-4-83	Luther Miller Mellwood, AR	Gave information about mound site and materials excavated and collected from it. Also gave information and locations of other local sites
10-4-83	John House Monticello, AR	Reported to Arkansas Archeological Survey archeologist finding of mound site and showed him some material. He identified it as Late Mississippian
10-18-83	Luther Miller Mellwood, AR	Gave more information about mound site and allowed pictures to be taken of materials from it